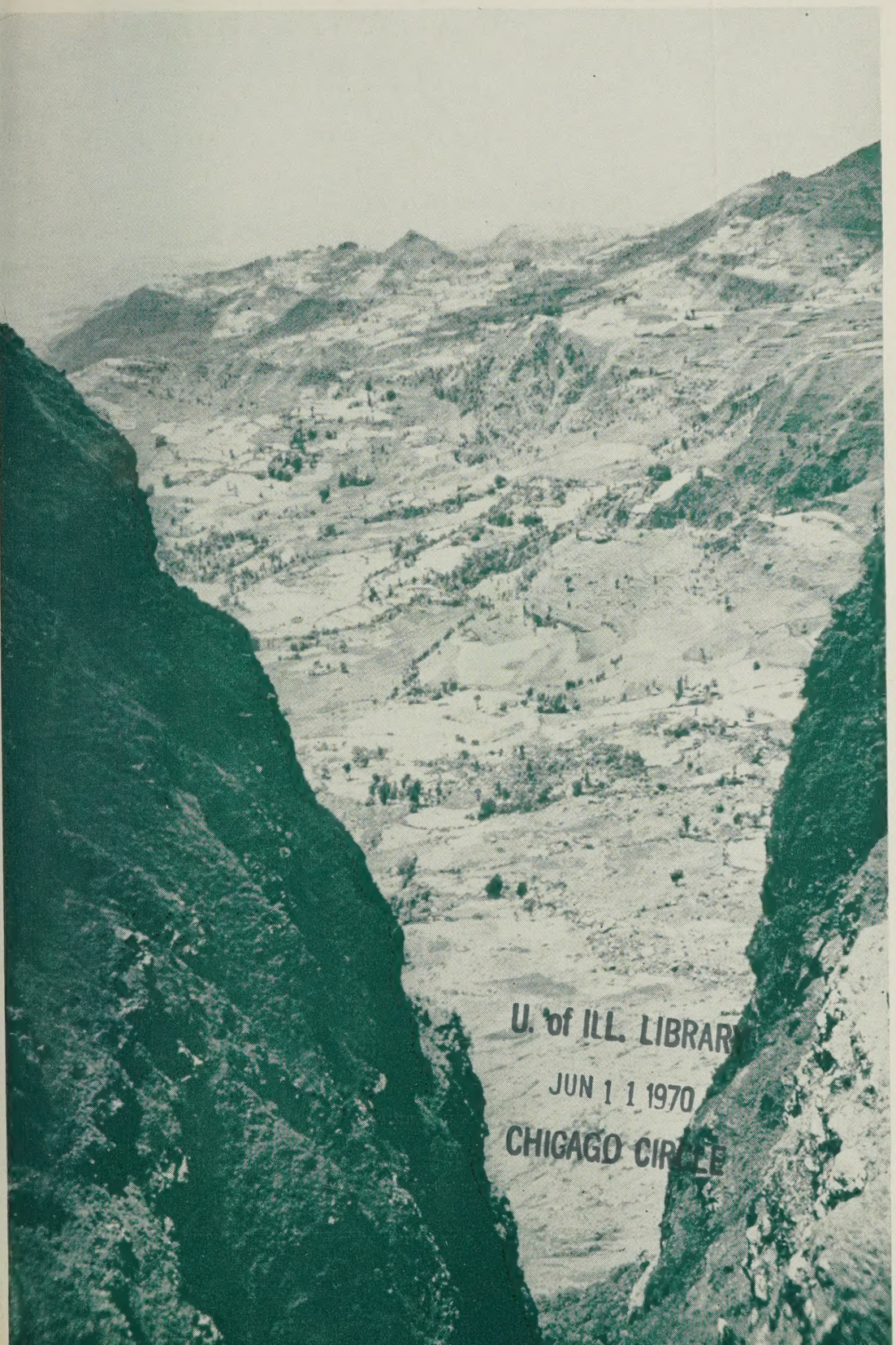
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THE ESCARPMENT EDGE OF THE GREAT RIFT VALLEY

The view here, at an altitude of over 10,000 ft. (just above the pass called Tarmarbar), is possibly one of the finest anywhere along the great African Rift Valley. The land drops in a series of great step faults down to the Danakil desert. Just beyond this point the road passes through a large tunnel and zig-zags down the escarpment to the town of Debre Sina and on to the north and east. The escarpment of many thousands of feet is entirely composed of the great series of basalt flows which occurred in Ethiopia in Tertiary times.

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Photo : Richard Greenfield

AN EXPLOSION CRATER AT BUTAGIRA

These craters lie up against the escarpment edge of the Rift Valley which rises up to the west to form the great upwarped Gurage Mountains. There are explosion craters such as these associated with the Rift Valley in other parts of Ethiopia. They are in many ways very similar to the famous craters of Katwe near the Ruwenzori Mountains in the western Rift Valley in Uganda.

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The Geology of Ethiopia

by Dr. PAUL MOHR

The purpose of this article is not to describe the geology of every square kilometre of Ethiopia, but is rather a history of the region, the events and processes which have led to the country being what it is today.

Ethiopia is part of the structural unit of the Horn of Africa, in which should be included Arabia, the Red Sea and Gulf of Aden. The geological history of the Horn of Africa and of Arabia is of an integral nature.

PRE-CAMBRIAN

The first eight-ninths of the earth's history up till 500 million years ago includes the whole of the Pre-Cambrian aeon. Fossils are rare and obscure. It was not until the Cambrian that the abundant shelly marine fauna filled the seas. Therefore the dividing of the Pre-Cambrian strata is difficult or impossible, though it may be noted that the oldest known fossil occurs in Shambaian Limestone in Rhodesia.

The Pre-Cambrian strata in Ethiopia are known as the "Basement Complex" as they form a basement for and underlie all more recent rocks. As the name implies it is complex in structure and petrography. Metamorphic rock predominates with schists commoner than gneisses and para-schists commoner than ortho-schists. The vast synclinorum of the Mozambique belt extends through East Africa up to Borana, appearing again in Tigre. It is formed of phyllites, chlorite quartzitic sandstones and unfossiliferous nodular limestones. It represents a great geo-syncline running north-south through present-day Ethiopia which was later intensely compressed and folded in orogenisis. Three Pre-Cambrian originies have been recognised in southern Africa but no classification is yet possible in Ethiopia, though one could be made according to the varying degrees of metamorphism, the most metamorphosed rocks probably being the oldest. It is of interest to note the orientation of the geo-syncline and its subsequent folding seem to have controlled the much later formation of the Rift System.



Photo : Richard Greenfield

THE VALLEY OF STONES

This valley lies between Harar and Jigjiga. Here the cover of sedimentary and volcanic rocks has long since been eroded away and the granites and gneisses of the basement rocks are exposed and eroded into weird shapes. This basement complex is the skeleton of the African continent. In Ethiopia it is more frequently covered up by younger rocks, except where it is occasionally exposed in the gorges or at the periphery of the great high plateaux. The basement is exposed in Eritrea in the north; in the south and south-west, and in the east, where this picture was taken.

Igneous rocks in the basement complex are common, especially plutonic intrusions and granite with more basic differentiates. Hypabyssal rocks, including pegmatites and mineralized veins are very common and form the last phase of igneous activity in the Pre-Cambrian in Ethiopia, The latest intrusions are not metamorphosed. The magmas were alkaline like the later Rift System lavas and are similarly restricted geographically. The end of the Pre-Cambrian was marked by an ice age in South Africa but it has not been proved in Ethiopia.

PALAEOZOIC

The Palaeozoic was an era of denudation in the Horn of Africa and Arabia. There are no proven deposits of this age in Ethiopia, and the era is represented only by an unconformity. The old landmass of Pre-Cambrian strata became peni-plained except for isolated mountain ranges in Dankalia, Somaliland, Somalia and Socotra. The whole of Africa has in fact remained stable since the Pre-Cambrian. No oroginies have occurred except to form the Cape Mountains and the Atlas Mountains in the Hercynian. Only epeirogenosis and rift faulting have affected Africa and Arabia since the Pre-Cambrian. At the end of the Palaeozoic in the southern hemisphere there was an extensive glaciation, recognised in Africa as far north as Mombasa.

Those who hold to the theory of Gondwanaland believe that this immense continent began to break up at the end of the Palaeozoic.

MESOZOIC

The beginning of the Mesozoic is marked by an epeirogenic sinking which caused the sea to transgress over the Horn of Africa from the south-east. This is precisely dated as the end of the Triassic, but in Syria, Arabia, East Africa and Madagascar, the transgression

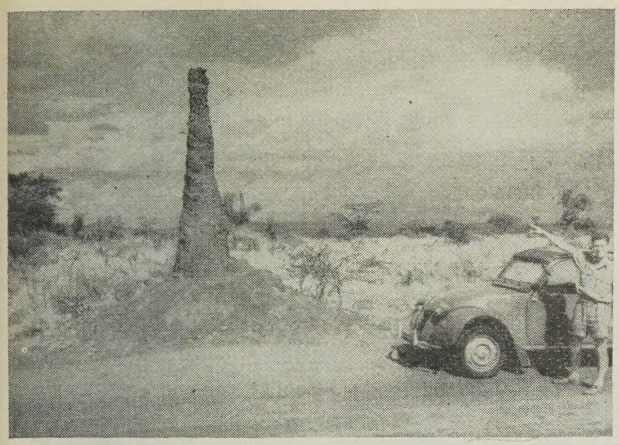


Photo : Richard Greenfield

A GREAT ANT-HILL

This ant-hill, and thousands like it, are built up on the basement rocks in the south of Ethiopia beyond Neghelli towards the Dawa-Parma River.

was somewhat earlier. The sea transgressed over the peni-plain of the Horn of Africa in slow and regular fashion, but leaving the above mentioned mountain ranges as islands. As the sea advanced, litoral sands, to form the Adigrat Sandstone, were deposited, often with conglomerate at the base. The Adigrat Sandstone is therefore a lithological facies, not the usual temporal facies found in sedimentary rocks. Its age is Upper Triassic to Rhaetic in Somalia and north east Kenya, Liassic in Harar and Shoa, and Bajocian to Bathonin in Tigre. It is a massive sandstone with poorly sorted sub-angular grains. It is frequently ferruginous and is unfossiliferous. In Tigre it contains a thick shale band. the thicknesses of the Adigrat Sandstone vary from 80 to 90 metres in Harar, 200 metres in Chercher, 500 metres in Shoa and up to 1,000 metres in Tigre, then thinning further to the north-west where it merges to the marginal Eritrean and Wollega sandstones. Whilst the Adigrat Sandstone was being deposited at the sea margin, the Antalo Limestone was being deposited in deeper and clearer seas to the south-east. Therefore as the transgression spread, so did the deposition of limestone. The Antola Limestone began to be deposited in the Liassic in Kenya and Somaloland, the Bajocian in Shoa, the Bathonion in the Danakil Alps, and the Oxfordian in Arussi and Tigre. Reef limestones were deposited in Shoa after the Bajocian. In the Ogaden, Somaliland and Kenya deep water favoured deposition of shales, alternating with limestones, and the fauna includes ammonites and belemnites, especially after the Oxfordian. The ammonites spread as far north as the Danakil Alps. Otherwise over the Horn of Africa, the fauna was predominantly a neritic one of alpine type pelecypods and brachiopods. Corals and echinoids are also common.

The limits of the Mesozoic transgression have been determined by geologists to have been along a line through Asmara, Sittoma (on the Settit River), Galabat (on the Atbara River), just west of Lake Tana, west of the Didessa River, the lower Omo valley, east of Lake Stephanie, to Wajir. This limit is represented by the marginal facies sandstone.

Towards the end of Jurassic (Upper Kimmerdjian) regression of the sea began and continued rather rapidly into the Cretaceous, with deposition of the litoral Upper Sandstone facies. The epeirogenic uplift which caused this was first indicated by the deposition of lagoonal gypsiferous and dolomitic limestone sediments towards the top of the Antola Limestone in Tigre Shoa and north-east Kenya. The Upper Sandstone is about 300 metres thick in northern and central Ethiopia. It is not to be confused with the Nubian Sandstone which is a continental Aeolian-type sandstone. To the south-east in Arussi and Ogaden limestone deposition continued into the Cretaceous through the interruption of the main gypsum formation in the Ogaden. In Chercher the Upper Sandstone contains Lower Cretaceous brachiopods, which are found in limestones in Arussi. Therefore in Arussi the Upper Sandstone above this limestone is probably of Upper Cretaceous age. Further east in the Ogaden the Upper Sandstone lies above Turonian Limestones; in eastern Somaliland it lies above Senonian Limestones and in Socotra deposition of limestone continued there until the Tertiary.

The Upper Sandstone in central Somaliland is 1,700 metres thick in the Guban and 600 metres on the present day plateau, but only 30 metres thick in eastern Somaliland, indicating tilting and uplift to the south. Whilst the transgression was fairly regular, the regression proceeded with many minor oscillations, especially with the Aptian transgression (depositing the Musakil Limestone over the main Gypsum formation in the Ogaden), the Albian regression (depositing the Ferfer gypsum), and the Turonian transgression (depositing the Belet Wen Limestone). The Cretaceous oversteps the Jurassic in Somaliland, East Africa and Madagascar. The fauna of the Cretaceous is impoverished; pelecypods predominate and corals are rare. The last ammonite is found in the Turonian at Semha.

At the end of the Mesozoic the sea had almost completely regressed from the Horn of Africa, only eastern Somaliland, eastern Ogaden, Somalia and Socotra remaining under the sea. In Ethiopia the only major landmass was a low flat plain subject to slight denudation from shallow sluggish rivers. The Abai River might already have come into existence as the Upper Sandstone is missing along its course. Lateritic weathering caused the formation of a crust of iron-rich rock on the Upper Sandstone, and further to the north and west on the basement complex.

TERTIARY

(1). **Marine Sediments:** In the Lower Eocene the sea deepened over the eastern parts of the Horn of Africa. There was no transgression but rather where Late Cretaceous Sandstones or Limestones were deposited, now Eocene Limestones with a neritic fauna were deposited. No litoral sandstone facies of the Eocene are known unless the top of the Gesomma Sandstone in the Ogaden and the Marcham Sandstone in north-east Kenya extend up into the Eocene. The sea shallowed at the end of the Lower Eocene forming huge anhydrite deposits with sands in Somaliland.

The regression which began in the Mesozoic continued with the Middle Eocene Limestones being more



Photo : Richard Greenfield **A TYPICAL ETHIOPIAN SCENE WITH AMBAS AND GORGES**

The word "amba" is used for flat-topped fragments of the plateaux which are left between the great gorges. The Ethiopian plateau was uplifted after the time of the eruption of the great plateau basalts, and the rivers, particularly the Blue Nile system, cut down into the plateau to create tremendous gorges, leaving the plateau fragments almost as islands. The gorge in the picture is part of the Blue Nile system.

restricted than those of the Lower Eocene. Estuarine deposits were deposited in western Somaliland in the Middle Eocene. At the end of the Middle Eocene (Auversian), the sea suddenly retreated completely from the Horn of Africa. Today the Lower and Middle Eocene Limestones are found lying at a height of 2,000 metres on the Somali Plateau. Post-Middle Eocene sediments are never found more than a few hundred metres above the present-day sea-level, indicating a great uplift in the Upper Eocene. In the Ogaden the Auradu Limestone, lying on the Gesomma Sandstone, is of Lower Eocene age and represents the only Tertiary marine sediments in Ethiopia. It is interesting in containing a weathered basalt flow.

In the Oligocene and Miocene, the coast line of Africa and Arabia was similar to that of the present day, though the Red Sea and the Gulf of Aden did not appear until the Miocene. In the Oligocene litoral sands were deposited in Somaliland and Somalia. In Somaliland the sandstones, grits, arkoses and conglomerates of the Middle Deban Series are 2,400 metres thick, indicating immense uplift to the South. The violent Lower Miocene faulting of the Gulf of Aden deepened the sea to the north, but restricted therefore the deposition of Miocene sediments. North of the fault scarp, the boulder bed (Upper Daban Series) was formed of immense blocks of older rocks, mainly Aura Limestone which fell to the foot of the scarp. The Upper Daban Series interfingers with the Dubar Limestones further north away from the fault. The Dubar Limestone consists of Aquianian Burdegalian reef limestones. After the Burdegalian the sea retreated abruptly from the Horn of Africa due to further faulting movements except that there was an invasion of Afar in the Pliocene. (2). **Trap Series:** Plateau basalt eruption associated with Upper Eocene uplift of the Horn of Africa commenced at the beginning of the Oligocene and probably extended into the Miocene in southern Ethiopia. The lavas were extremely hot and fluid and covered great distances in thin sheets. They covered a monotonously flat, slightly denuded, laterised land surface. The magma was basic and alkaline. Differentiates to more acid types gave the generally later lavas of the Magdala Group.

ii. Magdala Group: trachytes and rhyolites interbedded in the basalts. Absent to 2,600 metres.

i. Ashangi Group : Basalts 200—1,200 metres.

The basalts are generally poor in olivene with magnesium-rich pyroxene and magnetite abundant. Acid differentiates are usually hyperalkaline and frequently

undersaturated, with felspathoids replacing feldspars. At Adowa and Aksum and also Senafe occur the very interesting hyperalkaline hyppabysall grorudite-solvers-bergtite-tinguaite series.

The Trap Series is 250 metres thick in Serae, 1,500 metres thick in Quoram, and 3,500 metres in the Simien mountains. The Simien Mountains and other heights in Ethiopia are formed of ancient Hawaiian-type volcanoes. In the Simien Mountains there was a crater about 10 kilometres in diameter at the north-west end of the present massif. Acid intrusives weathered out as sharp hills, well seen north of Wolkafite Pass. The Trap Series is over 1,000 metres thick at Debra Sina and Ankobar, 500 metres at Fiche, but only 200 metres in the Abai Gorge. In the Arussi highlands the series is 2,500 metres thick with olivene basalts, nephelinites, tinguaite, panterllerite, etc. The peculiar development of the Trap Series occurs over Sidamo where it is represented by more than 1,000 metres of tuffs. The Trap Series is 500 metres thick near Harar. Mounts Chilalo, Jerer, Wachacha and Furi represent the latest phase of the Trap Series and tend to cover rift faults which otherwise post-date the Trap Series.

The age of the Trap Series on internal and external palaeontological evidence is placed between the Cretaceous and the Pliocene but the post-uplift formation of the Trap Series places it later than the Upper Eocene. Because it pre-dates the Rift System the Trap Series is therefore earlier than the Miocene, except perhaps in southern Ethiopia. Therefore the age of the Trap Series is in the main Oligocene.

(3). **Tectonics:**

(a) **The uplift of the Horn of Africa:** The uplift of the Horn of Africa must not be confused with the late Mesozoic and early Tertiary emergence. The regression was progressive with the Upper Sandstone facies becoming later in date to the south-east. It is unlikely that 3,000 metres of uplift was taking place in this progressive fashion. Again, the little denudation in Eritrea and Tigre between emergence in the Upper Jurassic and extrusion of the Trap Series in the Oligocene indicates that the land was low-lying till just before formation of the Trap Series. The Trap Series most likely accompanied the uplift. If uplift did indeed begin in the Mesozoic then the Trap Series accompanying this uplift would be found to be submarine in south-east Ethiopia, but it is always sub-aerial.

The uplift of the Middle Eocene in Somaliland has been at least 2,500 metres, not allowing for the depth from which these strata were uplifted from below sea level. In Ethiopia either Jurassic of Cretaceous strata are the latest marine rocks found, and the precise amount of uplift is more difficult to estimate. The isohypsals of the basement complex are better known to geologists and at least give a measure of the uplift. The strata of these isohypsals shows two major ridges, trending north-north-west south-south-west, and reaching over 3,000 metres in the lake Margarita region and in Tigre, a basin separating these two major ridges. Minor flexures in the dip slope of the uplift region coincide with the present river systems, except for the Abai and Omo whose courses were already in existence

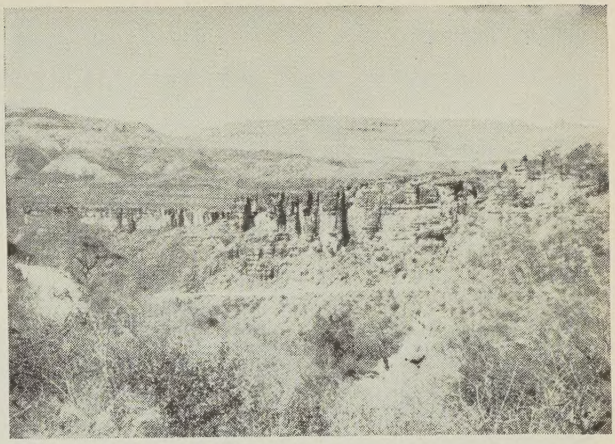


Photo : Richard Greenfield

SANDSTONE IN THE BLUE NILE GORGE

Beneath the horizontal flows of basalt are the earlier sedimentary rocks of Ethiopia. Often the great gorges do not cut through the basalts to reach these rocks, but the basalt cover is thinner towards the Blue Nile, and this gorge—one of the world's greatest gorges—cuts through the basalt and then the limestone to reach the standstone cliffs pictured above. Lower down the river even the sandstone is cut through and the ancient igneous basement rocks of Africa are exposed.

before the uplift occurred. The total flexure of the basement complex in the Horn of Africa has been at least 5,000 metres. It was probably tension associated with this uplift which caused the extrusion of the Trap Series along north-south fissures.

(b) **The Rift System:** The Rift System extends over one-sixth of the earth's circumference from Mozambique to Syria. From south of the Zambesi it extends via Lake Nyasa, branching to give the western rift, extending via Lakes Rukwe, Tanganyika, Kivu, Edward and Albert, and the eastern rift, extending across the central plateau of Tanganyika, central Kenya, Ethiopia, Afar, and north to the Red Sea through Jordan and the Dead Sea Rift. The Rift System follows the north-south ridge of Tertiary uplift and swell, but the actual formed of related but not inter-connected units. It is, however, closely related to the Pre-Cambrian tectonics.

A rift may be defined as being a sunken trough of land down-thrown between two faults. In Ethiopia the faults are normal and curvilinear; no thrust faults are known. Displacements up to 2,000 metres occur, but opposing faults are not necessarily of the same magnitude or age. The average width of the Main Ethiopian Rift is 80 kms. It may be noted here that the region of the Rift System is nowadays considered to be neither due to tension nor compression of the earth's crust, but to down-suction over descending currents in the earth's interior.

i. **Lake Rudolph Rift:** This has a rather uncertain connection southwards to the Gregory Rift at Lake Baringo. Lake Rudolph occupies a down-warp rather than a rift, there occurring flexures with only minor faults. It may be noted that faulting is small where the Tiertiary uplift was also small. Spot-faulting occurs on Mount Nyiru and Julal. The lower Omo valley is a gramen and some consider it to continue under



Photo : Richard Greenfield

LAKE ASHANGI, NEAR DESSIE

This very beautiful lake lies near the edge of the Rift Valley. The basalt flows, originally laid down horizontally, are tilted at varied angles and this is probably due to multiple faulting near the edge of the Rift Valley—faulting of a step-fault nature. It has been suggested that the lake is actually on the site of a collapsed volcano, but this is less likely. It can be seen from the marvellous mountain road which runs from Addis Ababa north to Asmara and which has probably no equal anywhere in the world.

(and thus pre-date) the Trap Series, via the Lake Tana Basin with its recent volcanism, Sittona and the Baraka Valley.

ii. **Lake Stephanie Rift:** This is very little known. Faulting and recent volcanic activity is known from Mega to Borana, but this is on the line of the Main Ethiopian Rift.

iii. **Main Ethiopian Rift:** Only the main points of interest in this complex structure can be noted here. The Amaro Mountains east of Lake Chamo are a 60 km. block of basement complew rocks with a summit at about 3,800 metres, Aligned north-south, they are either an upstanding block left by the faulting, or more likely have been squeezed up in similar fashion to Ruwenzori. The Gughe Mountains are the remnants of an old Hawaiin type volcano, like Simien. From north of Lake Margarita a belt of intense faulting and recent volcanic activity extends up the Main Ethiopian Rift. Lake Awasa occupies a fault basin. Here occur some of the rare transverse faults in the Main Ethiopian Rift. The eastern scarp of the Main Ethiopian Rift is fresher and larger (1,000 metres frequently stepped and scissored) than the western scarp. This is also found in the Gregory Rift of Kenya. Lake Shalla, which is deeper than any other lake in Ethiopia, with a depth of 266 metres, occupies an intensely faulted basin. The intense belt of faulting which first appears north of Lake Margarita passes east of Lake Zwai and through Wanji. This fault belt, which has been termed by the writer the Wanji fault belt, is between 5-12 kms. wide, and it is with this belt that all manifestations of recent volcanic activity in the Main Ethiopian Rift have been associated. The west scarp of the Main Ethiopian Rift, never well developed, disappears in the vicinity of Addis Ababa. From Addis Ababa east down into the Rift Valley, there is a gentle slope with only very minor faulting. This may be related to the fact that faults cross the Main Ethiopian Rift from the northern edge of the Somali plateau westward through Addis Ababa and Ambo. Although it is probable that rift faults are covered by the lavas of Jerer, Wachacha, Furi and Managasha.

North of the Awash river the intense Wanji fault belt continues along the rift floor with which is associated Mount Bosetigudda and its encircling ring faults, the surface cauldron subsidence of Garibaldi Pass, Fantale and recent flood basalts. Faulting on the rift



Photo : Richard Greenfield

THE ERODED CRATER OF WACHACHA

Mount Wachacha rises to the west of Addis Ababa and covers well over 100 square miles. The summit has at least one eroded crater. A neck of ancient lava forms a prominent knoll-like feature, often mistaken for the summit. It is seen from the summit in the photograph. The crater wall has now been breached by drainage and the crater floor and part of the rim are farmed today.

floor is extremely fresh and the region has a high seismisity. Folding of the rift floor is rarely observed.

iv. **Afar Depression:** The triangular region of Afar with sides averaging 800 kms. in length are bounded by immense scarps to the south and west. These scarps originate from faulting, but are now erosional. Thus Mount Asimba (3,248 m.) in northern Tigre is formed at its summit of basement complex rocks, and yet lies east of the present plateau scarp, proving that faulting lay even further to the east. The north-east boundary of Afar is formed by the Danakil Horst, associated with the Red Sea Rift faulting. The remarkable fact about the faulting along the edge of the Ethiopian Plateau is that the down-throws are to the west indicating a downwarp of Afar rather than direct faulting. The Borchenna and Guf-Guf graben were formed in this way. Internally Afar is not greatly faulted though faults may be buried under the extremely extensive and fresh fissure basalts. It may be noted that the unique structure of Afar occurs where the Red Sea, Gulf of Aden and African Rift Systems meet.

v. **Western Ethiopia:** The western boundary of the Ethiopian Plateau is defined by the complex cross

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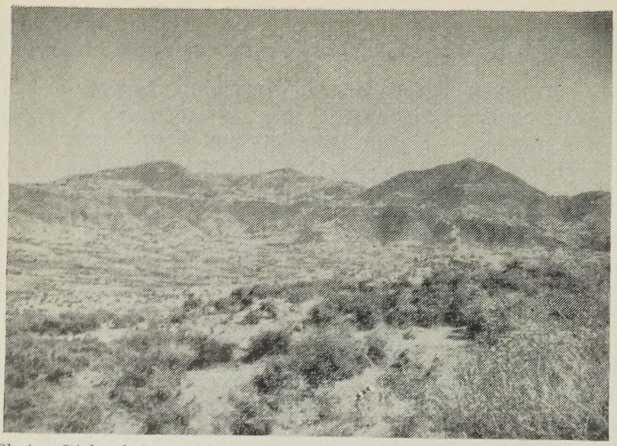


Photo : Richard Greenfield

PART OF THE RIFT VALLEY WALL NEAR KARA-KORIE

It was here that movements along the fault line associated with the Rift Valley caused the recent earthquake disasters. The epicentre of the earthquake seems to have been somewhat to the east of the town of Kara-Korie, but damage was done in many villages of the region and the shock was felt in Addis Ababa and Harar and recorded by instruments as far away as the United States. In the picture, the main well of the Rift Valley extends across from left to right. The mountains above the valley have been raised, or the floor of the valley lowered, or both, in earlier times.

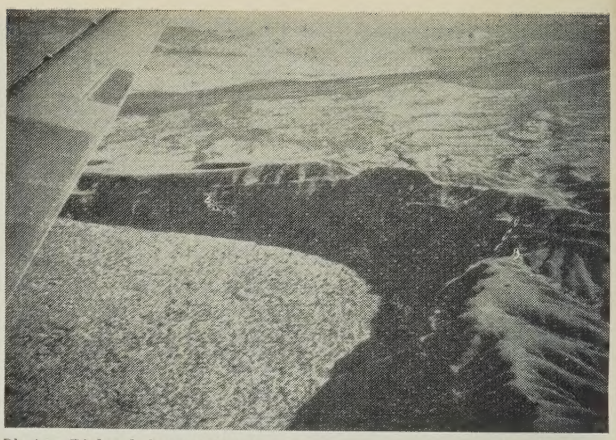


Photo : Richard Greenfield

THE GREAT CRATER OF WINZEGOOR

Nearer to Addis Ababa, and in the midst of a great field of recent lava, is the great crater of Winzegoor, seen here from the air. Some parts of the floor of the crater are covered with very recent lava reminiscent of that in Menengai crater, near Nkuru in the Kenya Rift Valley, supposed to be one of the largest craters in the world. This great crater is associated with the tremendous area of recent activity known as the Garibaldi Pass, or Metahara region, but it extends southwards along the Rift Valley as far as the volcano of Bosetti-Guda.

faulting 25 kms. west of Lake Tana, east of the Didessa River and east of Galabat. Most of the faults are older than the Trap Series and some are observed to be later. The Lake Tana basin is not tectonic although associated with recent lavas. Faulting is rare and maximum depth of the lake is only 14 metres.

THE AGE OF THE RIFT SERIES

The Red Sea Rift faults first occured in the Oligicene but major faulting occurred later in the Miocene when the Red Sea Rift was flooded from the north. Suez was uplifted and became land again in the Upper Miocene. The Gulf of Aden Rift was formed by major faulting movements in the Lower Miocene, but it may be noted that the Straits of Bab el Mandeb and Afar were not flooded till the Pliocene. The Gregory Rift in Kenya was formed by two major periods of faulting; the first in the Upper Miocene and Lower Pliocene, and the second in the Lower and Middle Pleistocene. Displacements nearly 2,000 metres occurred in this second period of faulting. The age of the Rift System in Ethiopia has largely been determined by analogy with the Rift System of the related areas discussed above. In most of Ethiopia the extrusion of the Trap Series had ended by the Miocene. It is considered that Afar was formed during the Lower Miocene. The Main Ethiopian Rift was probably formed at a later age, related to that of the Gregory Rift in Kenya. In the Lake Rudolph basin burdigalian fauna is found near the bottom of the Trap Series and these lavas are cut by the rift faults which must therefore be of late Miocene or early Pliocene age.

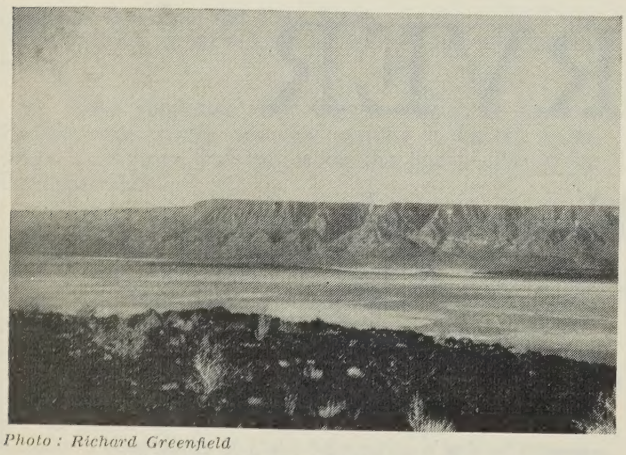


Photo : Richard Greenfield

SALT PANS IN THE DANAKIL DESERT

The Danakil Desert is famous for the drying up of rivers and streams—the River Awash evaporates and sinks into the sand in a number of salt lakes near the boundary with French Somaliland. The desert is a region of very recent—and in some places current—volcanic activity. In the picture seen above, not far from the road from Assab to Combolchia, the black basalts of the foreground have little vegetation, and streams in the valley are drying and leaving salts pans.

QUATERNARY

During the Quaternary there is evidence along the sea coasts of the Horn of Africa of complex uplift and subsidence movements associated with faulting. Raised and submerged beaches and coral reefs are typical phenomena and the latest movements are those of uplift, as is proved by the rejuvenation of most of the rivers in Ethiopia.

Whilst the Ice Ages were affecting the northern hemisphere in the Pliestocene, there were Pluvials (wet periods) in East Africa. During this time the glaciers on the great peaks of East Africa were much more extensive than today. Today even the highest mountains of Ethiopia are below the snow-line, but there is evidence of two former glaciers on the Simien mountains when the snow-line descended as low as 4,100 metres.



Photo : Richard Greenfield

VIEW FROM MOUNT CHUBBI

This large subsidiary crater on the eastern side of Mount Chubbi contains evidence of what is probably the last phase of activity, and the view from the crater rim is magnificent. Looking to the south, over recent lava flows piled one on top of the other and rich with masses of black obsidian which flashes and sparkles in the sun, can be seen the northern shore of Lake Awasa, with its ash and cinder cones. The lake itself is completely visible, as also are the earlier shore lines which mark its shrinkage since the rainy times of the Ice Ages in other parts of the world. Not shown in the picture, but also obvious from the crater rim are the fault lines of the Rift Valley and the fault lines which cross the valley at this point giving rise to many hot springs and probably causing the volcano itself.

Cirques and moraines prove that the glaciers descended to about 3,600 metres. Lake Tana and the lakes of the Main Ethiopian Rift were very swollen during the Pluvials. Lakes Zwai, Langano, Abayate and Shalla were joined together and probably these were joined with Lake Awasa before the Lake Awasa basin was faulted. Enormous terraces in the Lacustrine sediments prove that the lakes are today shrinking rapidly. At the end of the Pleistocene, Lacustrine Limestones were deposited in the Bishoftu region and in southern Borana and northern Kenya.

During the Pliocene and Quaternary the lavas of the Aden Volcanic Series were extruded, confined almost entirely to the Rift System. The exception is the large occurrence of more recent lavas from Bahar Dar to Danghila which blocked the Abai and caused the formation of Lake Tana over faulting but tilted the strata in this region back to the East. The lavas of the Aden Volcanic Series belong to same magmatic phase as the lavas of the Trap Series and are only distinguished because they happened to occur after the formation of the Rift System. The lavas are highly alkaline and central type acid eruptions tended to occur before the later flood basalts. Most recent lavas (Lake Rudolph, Mega, Bosetigudda, Garibaldi Pass, Fantale, Enta-Ale, Dubbi, Alid and Bahar Dar) are all basic with the exception of the riolite obsidian of Chubbi which lies on a transverse fault north of Lake Awasa. Volcanic eruptions in historic times have occurred south of Lake Rudolph in 1897, at Garibaldi Pass and Fantale about 1810, Dubbi in a major eruption in May 1861, Afdera in June 1907 and Erta-Ale, Ummuna and Chibre-Ale which are erupting today. Immense recent lavas of fissure basalts have occurred eastwards in south-west Afar.

Explosion craters are common along the western margins of the Ethiopian Rift System. At least a dozen occur near Bishoftu, three near Butajira, three south of Lake Kilito, one of which is associated with lava, one south of Lake Shalla, three near Mega, one west of Debra Libanos, one to the south of Dessie, three south of Lake Tana, three near Enjibra, three near Galabat, as well as many older ones such as those north of Mount Kakka on the Somali Plateau.

This article has served only to give a very brief outline of the main features of the geology of Ethiopia. It must be emphasised that in most of Ethiopia the detailed geology remains to be illustrated. There is a tremendous field for future research in geology in Ethiopia.

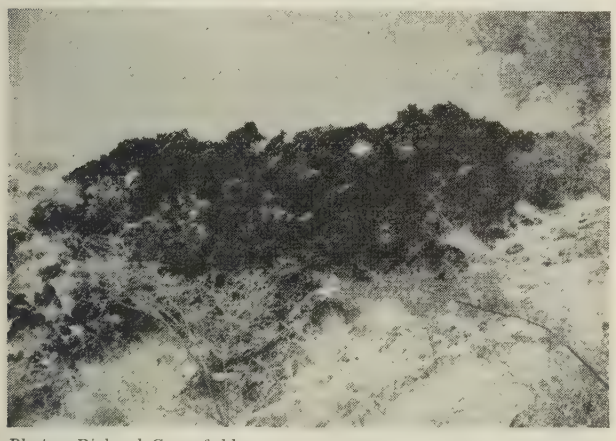


Photo : Richard Greenfield

LAVA FROM THE FLANKS OF MOUNT FANTALE

Mount Fantale is one of the more fascinating of the recent Rift Valley volcanoes. The lava seen in the picture is probably less than 200 years old, and there has been no time for vegetation to develop upon it. As well as erupting from the top of the caldera and from the floor of the great caldera crater, lava flowed from the subsidiary crater on the south-east flank of the mountain and flowed down to Lake Metahara.

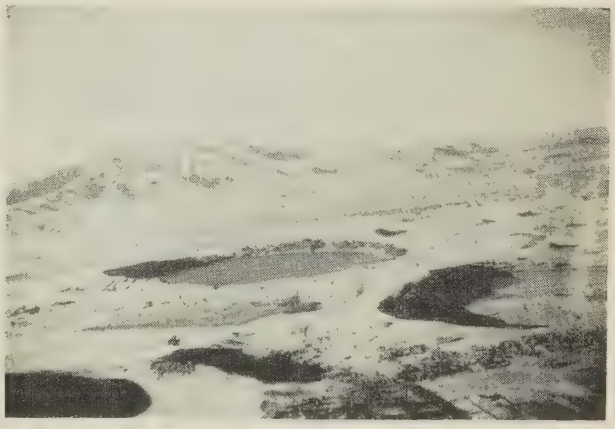


Photo : Richard Greenfield

THE EXPLOSION CRATERS OF DEBRE ZEIT (BISHOFTU)

These craters were formed by volcanic explosions, doubtless connected with the lines of weakness in the crust of the earth associated with the faulting of the Rift Valley. The edge of the Rift Valley in the Bishoftu region is obscured by later volcanic activity, but the craters themselves are not normally associated with the eruption of lava. In the background is the ancient volcano Mount Yarrer.

Some Notes on the Scenery of the Ethiopian Rift Valley

by G. G. LAST

To most of us who have lived for some time in Addis Ababa, the main road leading south from the capital towards the lakes in Arussi and Sidamo provinces has become very familiar. The shores of Lakes Langano, Shalla and Awasa, in particular, have become the 'Riviera' of Addis Ababa. Increasing numbers of people are making this relatively short journey (200-250 kilometres) to take advantage of the lower altitude, the sunshine and the bathing, boating and fishing. The row of multicoloured tents on the shores of Lake Langano and the difficulty in booking accommodation in the camping hotels of Lake Awasa on public holidays and during the weekends are evidence of the popularity of this region. For our families living in the inland capital of Addis Ababa, this has become the substitute for the seaside. Others, seeking only the sunshine and the warmth and an escape from the rains of 'Kremt' in the highlands, make a day or weekend trip to the hotels at Debra Zeit, Mojjo, Koka or Nazret where, in the evening it is possible to relax on the veranda with a cool drink. Further afield, in the same direction, is the delightful hotel at Awash Station which can easily be reached by railway from Addis Ababa and where a complete change of surroundings can be found.

It is true that there are many regions in Ethiopia where the scenery is more spectacular. The Abbay (Blue Nile) River gorge, for example, is challenged in scale and beauty only by the Colorado Canyon in the U.S.A. The eroded western edge of the Semien mountains in Begemeder province, seen from the road between Aksum and Gondar is a breathtaking picture of light and shade, white cloud and blue sky. The eastern escarpment of the plateaux of Ethiopia at Debra Sina is without parallel in its magnificence. Although the region of the Rift Valley to the south and the south-east of Addis Ababa cannot rival the grandeur of the mountainous areas to the north, the landscape of the Rift Valley is, in fact, of great interest. Here we can see some of the more recent work of nature. It is a region where volcanic activity has been primarily responsible for the scenery which we view today, and the features of this landscape include a variety of volcanoes which, together, could be considered as a 'landscape laboratory' which could not be surpassed in most regions of the globe. The general description of the region which now follows draws attention to the more outstanding features of these parts of the Rift Valley which are most accessible from Addis Ababa. This may stimulate others to visit this remarkable area and it may give the occupants of the cars which speed southwards from Addis Ababa towards their holiday resorts a greater understanding of the landscape through which they are travelling. It may lead some to pause and turn aside for a while to view features which are within easy reach of the main road. For those who are stimulated to further investigation, a short bibliography of more detailed and technical literature is appended to this article.

Curiously, the most widely available and most widely read description of the recent volcanic phenomena in Ethiopia, deals with the area which is least accessible. L. M. Nesbitt's "Desert and Forest," which is the account of his hazardous journey from Awash Station to Mersa Fatma, south of Massawa, is notable both as a record of an incredible feat of endurance and as a graphic account of the topography of the northern section of the Rift Valley. Here are two typical passages from this remarkable book :

"We left Magu, and came to the foot of Mount Ayelu. It rose, an imposing cone-shaped mass, from the level plain. The absolute dearth of vegetation on that volcanic massif was a sign of what lay before us if we left the close proximity of the river, and indeed we soon saw that the thick grass through which we were travelling ceased abruptly at the edge of the mountain. Though the life-sustaining river was within rifle-range of us, yet that awful mountain hanging heavy in the landscape struck a dominating note of famine and death."

Nesbitt is describing here a section of his journey along the course of the Awash river shortly after setting out from Awash Station. Later, we have a description of a typical terrain in the Kobar Sink (a depression some 300 feet below sea level) in the north of the Danakil region :

"Presently we were confronted with wide belts and

ridges of scoriae, lapilli and clinker. Our feet no longer found any hold, as everything crumbled and fell away. A noise as of broken glass and shards of pottery was heard under our feet, and an acrid dust arose and filled our nostrils and our parched throats. The lapilli ridges proved more difficult to negotiate than anything we had previously encountered. Some of these ridges were sixty feet in height, and sloped steeply on both sides : the width of the top varied from a few yards to half a mile. In climbing these slopes, there was no foothold, and frequently, instead of climbing upwards, we slid a dozen paces lower down. Often we threw ourselves flat on the ground in the endeavour to stop ourselves from sliding down when a wide patch of the slope began to move bodily downwards, bearing us with it."

The country crossed by Nesbitt is far from the normal routes followed by travellers but some idea of this desolate region can be gained from a trip down the Assab road which crosses the desert. Barren volcanic hills, lava fields, cinder cones and the salt pans formed in the dried-up beds of ancient lakes can be seen along the route.

This Danakil Plain is part of a vast system of relatively low-lying country which stretches from the Middle East, down the Red Sea, through the centre of Ethiopia and down the eastern side of Africa as far as Mozambique. Its origins are to be traced to powerful and extensive pressures on the crust of the earth. When pressures of this kind occur, the crust of the earth either buckles and folds, or it fractures. Since the crust in the region of East Africa and Ethiopia consisted of a rigid block of old hard rocks, great cracks (faults) appeared in the surface of the earth and the separate pieces thus created moved in relation to one another with the result that areas of highland and lowland bounded by fault lines were formed. It seems probable that the region now occupied by Ethiopia lies where the most active of these movements took place. Ethiopia is approximately half-way between the northern end of the fault system in Syria and the southern end in Mozambique and here, instead of a simple system of parallel fault lines enclosing a rift valley, we find faults which converge from a number of different directions. There are several reasons for supposing that this 'Eastern Horn' of Africa lay at the centre of the activity which produced the colossal fracturings. In the first place, the vertical displacement of the crustal bloc is probably greater here than in other areas and in places has been estimated to be as much as 6,000 metres. Secondly, the star-like pattern of fault lines has its focal point to the south-east of Addis Ababa and this pattern is not reproduced elsewhere. Also, the outpourings of lava which accompanied the cracking of the earth's crust seem to have been more abundant in the area now occupied by the Ethiopian Highlands. These flows of basalt certainly produced the largest area of very high country on the continent of Africa and in places, for example in the Semien mountains, the basalt is estimated to have attained a thickness of 3,500 metres. The final point, which concerns us closely in our study of the present scenery of the Ethiopian Rift Valley, is that the volcanic activity and earth movements have continued in this region to the present day, whereas, in most other areas through which the great Rift Valley structure passes, this kind of activity is much less noticeable.

In the region of Addis Ababa, the major lines of the

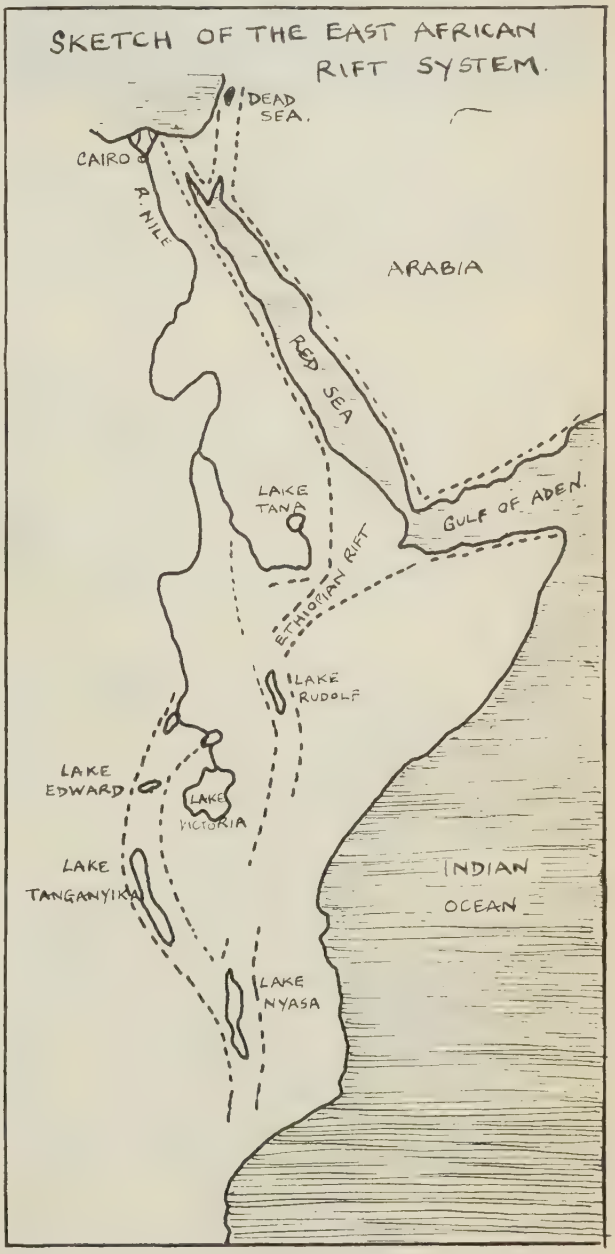




Photo : Richard Greenfield

THE CRATER LAKE OF ZUQUALA

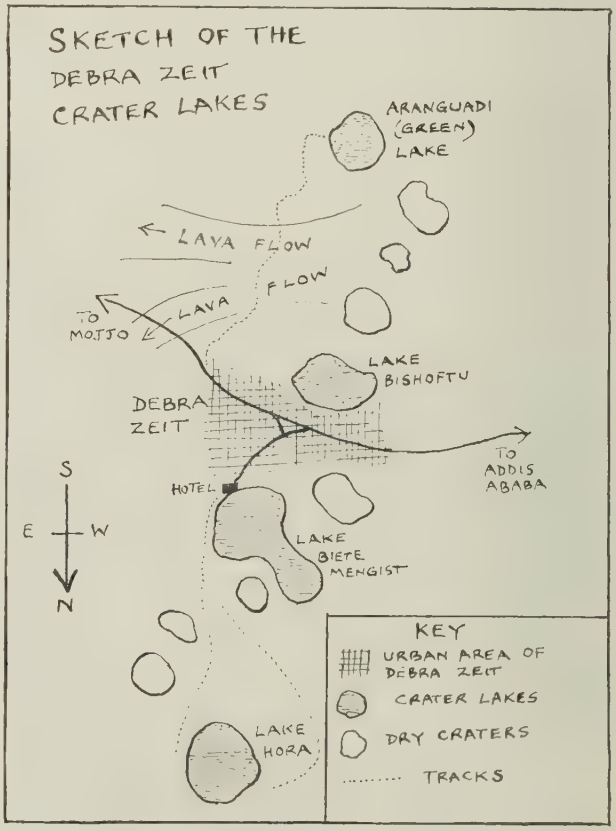
Zuquala, a mountain rising to the south of Addis Ababa and pictured on the 10c. stamp, is a more recent and perhaps more picturesque volcano than Mount Yarrer or Mount Wachacha. The crater is still perfectly preserved, and it is a beautiful lake which is well-known as a holy lake: for many centuries the top of the mountain has been the site of a monastery. Mohamed Grañ destroyed one of the buildings, but it was subsequently rebuilt and it is actively used to this day. A fine view of the Rift Valley and northern part of the Ethiopian lake district is obtained from the summit of Mount Zuquala, which can be reached in a sturdy vehicle by a rough track.

system of faults are obscured. The clearly defined edge of the escarpment, which can be seen at Debra Sina on the Dessie road, is replaced in southern Shea by a much broader belt of faulting and earth movements are much obscured by later volcanic activity and by river erosion. This broad belt of faulting is, however, partly responsible for the choice of the site of the capital city, since here is the one place in the 1,000 miles of contact between western plateaux and rift valley where there is a comparatively easy route which gives access to the plateaus from the coast—a route now followed by road and rail.

We begin to have evidence of these successive small escarpments shortly after leaving Addis Ababa. Some 20 kilometers from the capital we reach the new Akaki Cotton Factory perched on the crest of a fault line overlooking the Akaki river. Beyond the village of Akaki, the road climbs again to the edge of an escarpment which overlooks the village of Dukam and the plain in which stands Mt. Zuquala, the most prominent feature of the landscape to the south of Addis Ababa. Here is a classical volcano of the type drawn by all of us in school note-books. Its conical shape and steep-gullied sides seem impregnable but a four-wheel drive vehicle will take us to the top in dry weather. The track, which leaves the main road at the entrance to the village of Dukam, brings us to the summit in about an hour and a half. There we can glimpse through the trees the gem-like crater lake set below the steep inside walls of the crater—a miniature paradise cooled by pleasant breezes and scented by the groves of 'tid' (juniper) in which is hidden the monastery of Gabre Menfas Kiddus. This much-revered Saint is reputed to have jumped into the lake.

Zuquala has long ceased its eruptions and is older than many of the volcanic features of the area. If we turn our backs on the crater lake and look down into the plain we can see dark patches which mark flows of more recent lava. These are covered by scrub and stand out from the intensively cultivated areas of farmland surrounding them. To the north-east towards the horizon and the main road we can see the line of low hills which hides the sites of the crater lakes of Debra Zeit (Bishoftu). Experts have discussed at length the possible origin of these crater lakes. It was thought at one time that they marked the resting place of a meteoric shower which had hit the surface of the earth and punched craters similar to but much smaller than the well-known example in Arizona. It was said that strange magnetic effects in the region proved the existence of quantities of magnetic iron beneath the surface. They are now generally assumed to be volcanic craters formed by a series of explosions along a line of weakness in the crust of the earth. This line of weakness lies approximately parallel to the faults nearer to Addis Ababa, already mentioned.

The Debra Zeit Hotel stands on the rim of the largest of these craters—a double crater which has created a lake shaped like a ' figure eight.' Lake Biete Mengest. A kilometre or two to the north-east is a second lake, ' Hera,' blue and attractive in its setting of green slopes and more peaceful than the rock-scarred Biete Mengest. Immediately behind the houses which line the western side of the main road in the centre of Debra Zeit is yet another crater lake. It is deeply set within the steep



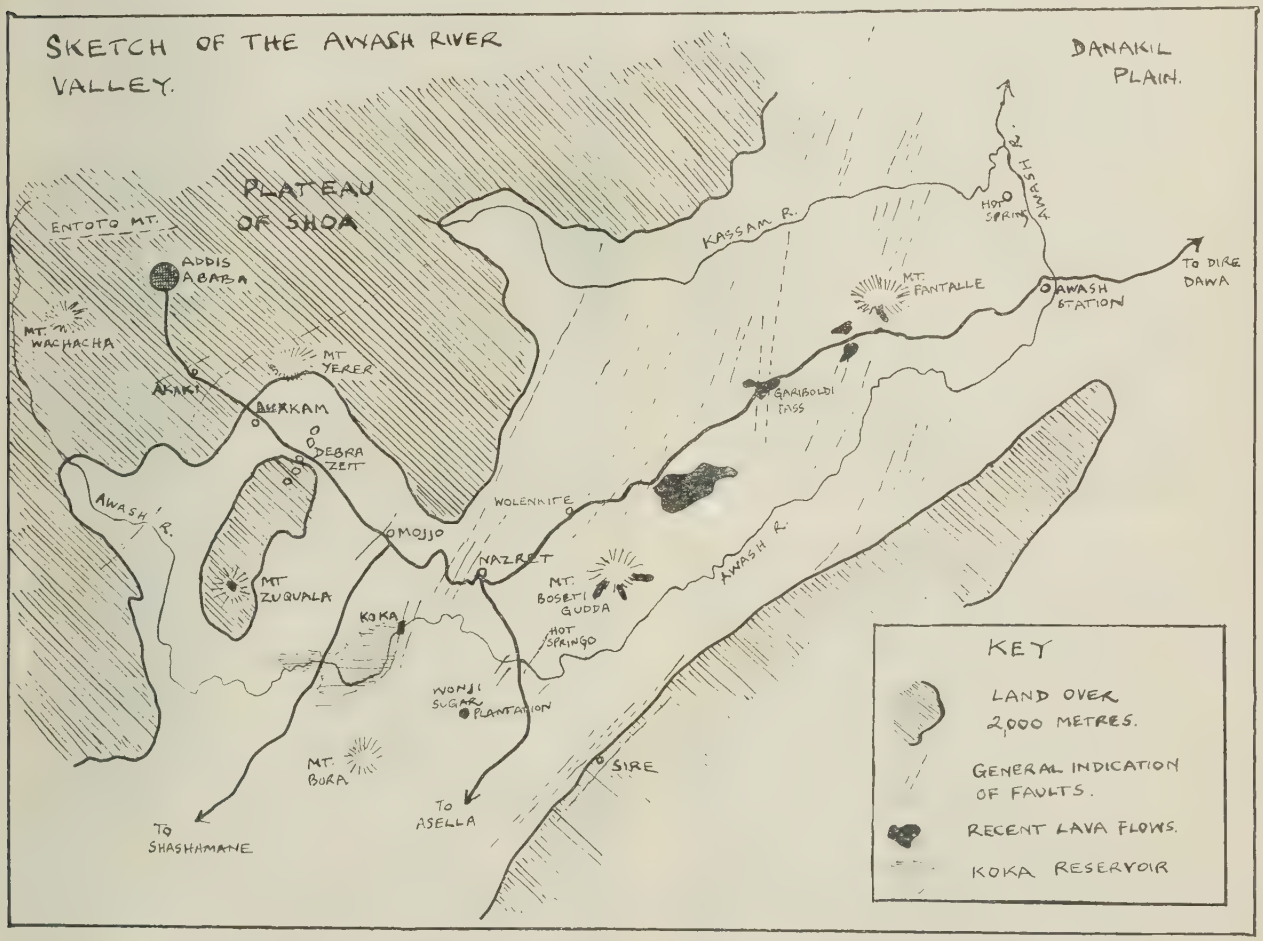
After Dr. P. Mohr

surrounding walls of the crater and its existence comes as a surprise to many—even to those who have gone slightly further afield from the same side of the main road and visited the more publicised 'Green Lake' whose algae-coloured magnificence glows in the blacks, reds and greys of the surrounding cliffs. To reach the waters of Green Lake we must follow the steep track which has been worn deep into the beds of ash forming the sides of the crater. Here, on the side of the path, we can read the story of the materials of various kinds which have been ejected during the active life of this crater.

Leaving Debra Zeit and its crater lakes behind, we continue our gradual descent towards the Rift Valley. Just before Mojjo (70 kilometres from Addis Ababa), the road curls down a small escarpment to the Mojjo river. If we take a short walk across the meadows we can reach the point, slightly downstream, where the river takes a spectacular plunge over the basaltic rocks exposed by this fault line. Upstream from the falls, these same rocks have been used as the foundation for a small dam which creates a permanent pond of water for the local people during the dry season.

At Mojjo, we are at 1,788 metres, having gradually descended some 600 metres from Addis Ababa. We notice the change in climate and, looking towards the south-west we can see for the first time the outlines of the Rift Valley proper.

Just to the south of the latitude of Addis Ababa the south-south-west—north-north-east trend of the faulting which forms the limits of the Lakes Rift Region to the south is modified and the comparatively narrow (50-60 km.) Rift Valley widens like a funnel into the broad lowlands inhabited by the nomadic Danakil and Issa peoples. The most impressive views of the western limits of these lowlands are to be had at Ankeber and at Debra Sina. At night, from Ankeber, we can see the lights of Awash Station below in the plain. Awash Station stands at the neck of the funnel and between this point and the Lakes Rift Region to the south-west is a most confused area crossed by the road from Mojje to Awash Station, by the middle course of the Awash river and by the railway. Here, the lines of communication and the river must cross many fault lines at right angles. One such fault line is very obvious where the road descends sharply before the level run into the town of Nazret, and on the Awash river, the fault lines are usually marked by



After Dr. P. Mohr

falls or rapids. At the site of Koka Dam, for example, the eastern end of the reservoir is formed by the small escarpment on top of which stands the new hotel. The Awash river has broken through the escarpment and the wall of the dam is now constructed on the basaltic rocks exposed by faulting and river erosion. On either side of the bridge which carries the Assella road over the Awash, fault lines occur again but this time, the escarpments face eastwards and the river drops over the edges in magnificent waterfalls.

From the main road, just short of the turning to the Koka Dam, there is a fine panorama of this section of the Rift Valley. The far wall of the rift, formed by the edge of the plateau above Sire in Arussi province, can be seen. Below, the Awash river crosses the floor of the rift and the site of Wonchi Sugar Factory in the plain is visible. Further to the east, beyond Nazret, a confusion of recent volcanics obscures the rift.

The road between Nazret and Awash Station is spectacular, not so much for the way in which it climbs the series of small escarpments in the floor of the Rift Valley, but for the manner in which it threads through evidence of very recent volcanic activity. Soon after we leave Nazret, the mass of Boseti-Guda can be seen on the right between the road and the Awash river. On the sides of this volcano are small flows of very recent lava. Beyond Walenkitti the road itself is evidence of recent volcanics as it has been surfaced with crushed clinker-like lava from flows which border the road. At 'Garibaldi Pass' the road skirts the side of a volcanic cone. The hillside has been cut back by the road makers and on the left, layers of ash ejected by volcanic eruptions can be seen. To the right of the road is a much more spectacular feature. We are running along the edge of a cliff and some hundred feet below is a sea of lava, black and forbidding. The cliffs on which we stand are the northern limits of a great depression formed between two north-south fault lines and from the depression, in quite recent times, lava has flowed towards the west. The recent nature of this activity can be gauged from the fact that dotted here and there over the surface are small trees and bushes, the first vegetation to secure a foothold on the twisted mass of lava. It is still easy to imagine this smoking, boiling pit in full eruption and overflowing in the direction of lower-lying country.

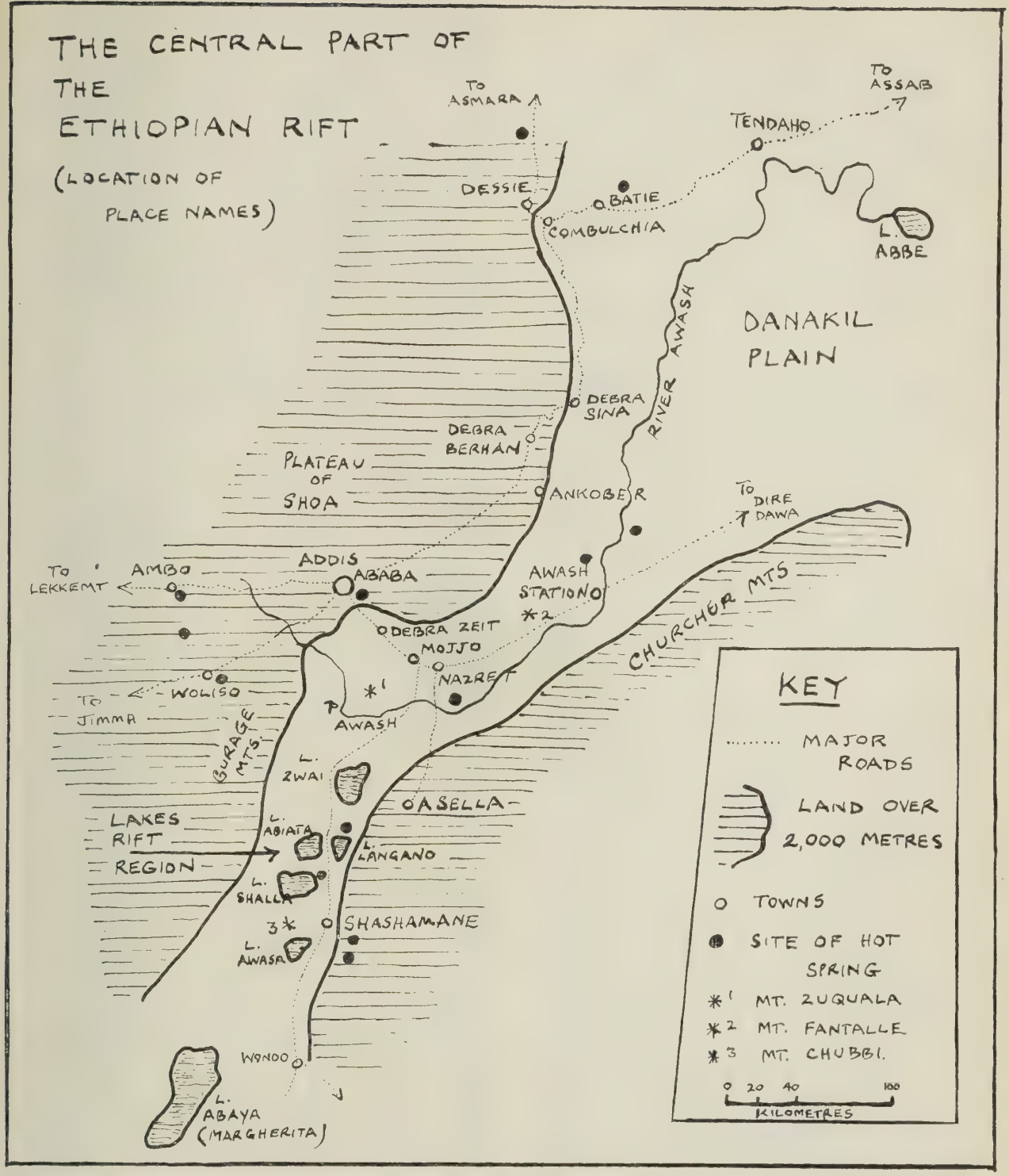
From the head of the pass, the road winds down towards the plain of the Awash river and its tributary, the Kassam. Between these two rivers stands ' Fantalle,' a formidable volcano standing on a base some fifteen kilometres broad. This mountain, which has not yet been fully investigated, resembles Zuquala in that it is built of lavas of an earlier period but, unlike Zuquala, is not yet completely dead and its vast crater, hidden from view at the level of the road, contains a number of fumeroles which, from the air, can be seen trailing plumes of steam. Standing out like a black ribbon on the side of the mountain nearest to the road is one of the most recent flows of lava. This, like the lava of the Gariboldi Pass, is practically devoid of vegetation and contrasts strongly with the scrub and grass covered sides of the volcano. As it nears the volcano, the road seems to have been attacked from either side by lava flows which have stopped just short of the road. The blocks of clinker, now cold, hard and brittle, seem to have been frozen in the act of tumbling over the front face of the flow as it once advanced, glowing and smoking across the ground. A few kilometres further on we come out across the plain with its tall savannah grass and scattered acacia trees. Here and there we can see small hillocks looking rather like rounded anthills but which prove on closer examination to be blisters of bubbles which have formed in the sheets of lava surrounding the base of Mt. Fantalle. Many of the blisters have burst at the top and the agents of erosion, working on the cracks, have caused their collapse. One large blister can be seen close to the left of the road. It has been cut through by the roadmakers so that the section with its hollow centre is exposed.

Leaving Fantale behind, we continue our journey across the plain and arrive at Awash Station, perched on the side of the deep gorge carved in the floor of the Rift Valley by the Awash river. Looking across the river from the rear of the Station hotel we see scenery very similar to that of the gorges which dissect the plateau of Shoa. The river has cut down through various layers of volcanic materials and we can see thicknesses of harder basalts standing out as steep cliffs between the slopes of softer rock. The bed of the Awash now rests on hard black basalt of the same age and appearance as that which forms the surface of the plateaux of Shoa, and a short trip from the hotel along the road to the bridge over the Awash where the river forces itself through a comparatively narrow gap in the basalt rocks will give us striking evidence of the power of the water which has carved this gorge. Standing on the bridge at a height of approximately 800 metres above sea level, we also have a practical illustration of the forces which have created the Rift Valley. The rocks at our feet which once formed a continuous surface with the basalts of the plateau of Shoa where we started our journey are now at least 1,700 metres lower than similar formations on the plateau.

The Awash River at this point turns approximately due north and continues its journey across the widening desert of the Danakil Plain only to be frustrated in its attempt to reach the sea as it evaporates its life away in the confines of Lake Abbe, a comparatively short distance from the Gulf of Tajoura. We, however, must retrace our steps to Nazret and Mojjo to continue our examination of The Rift Valley proper.

At Nazret, we can turn aside for a few kilometres along the road to Asella as far as the bridge over the Awash river. Here, we take the track which leads downstream from the near-side of the bridge to the hot springs. This is a feature, common in and near the Rift Valley, which confirms the volcanic nature of our region. If we had a day to spare at Awash Station we could have taken the track northwards across the desert, parallel to the Awash river, which leads to the hot springs at Alibete. Here is a real oasis in the desert, nourished by the hot water seeping from underground.

These hot springs vary considerably in temperature and mineral content. Most are rich in carbonates. Some like the hot springs of Lake Shalla are near to boiling point but others like the hot spring at Fin-Fine in Addis Ababa, now known as Filowaha, are around 70 deg. C. As the map shows, there are many of these thermal

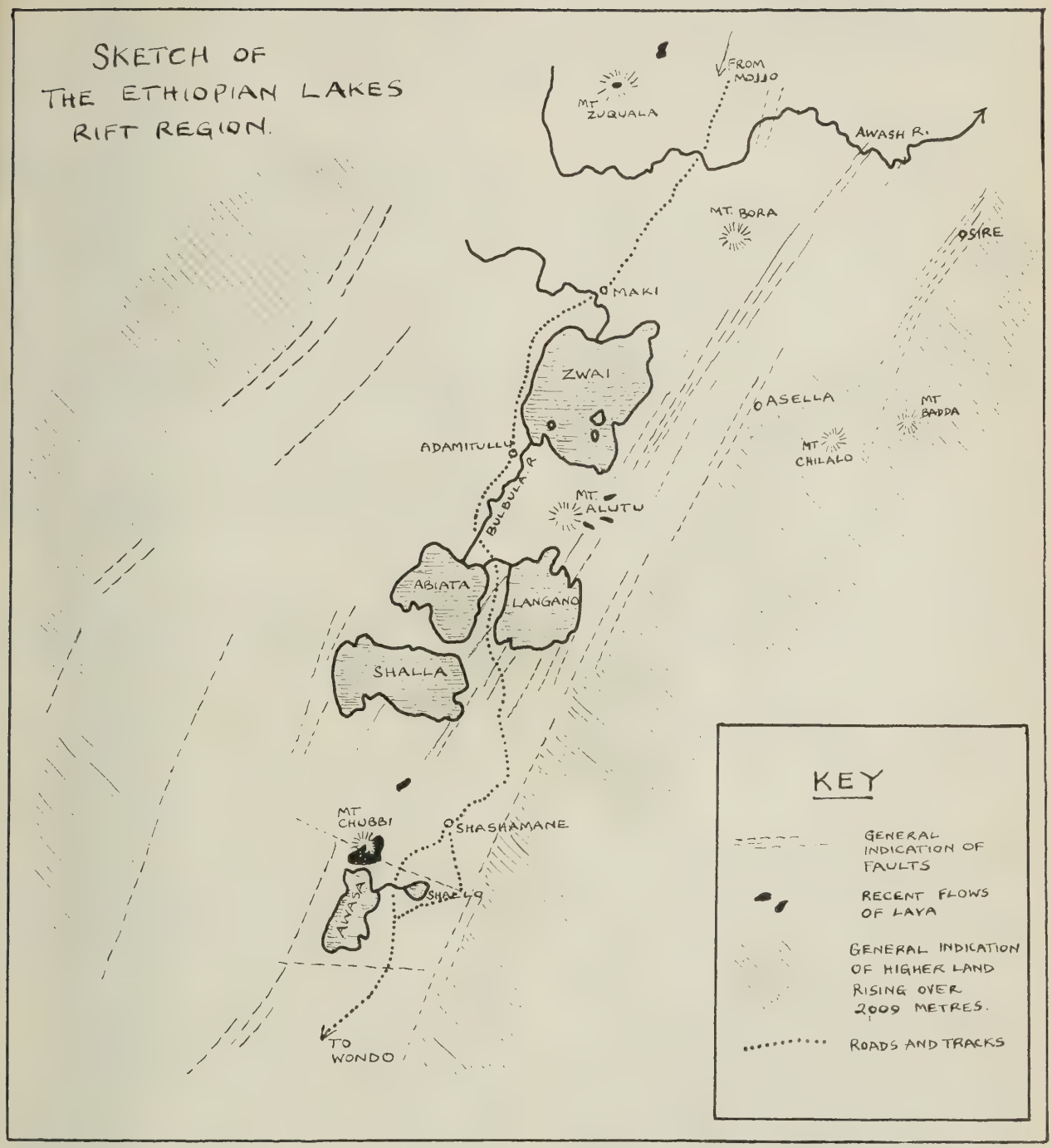

THE CENTRAL PART OF THE ETHIOPIAN RIFT
(LOCATION OF PLACE NAMES)
TO ASMARA
TO ASSAB
TENDAHO
DESSIE
BATIE
COMBULCHIA
L. ABBE
DANAKIL PLAIN
RIVER AWASH
DEBRA SINA
DEBRA BERHAN
PLATEAU OF SHOA
ANKOBER
TO DIRE DAWA
TO LEKKEMT
AMBO
ADDIS ABABA
AWASH STATION
CHURCHER MTS
DEBRA ZEIT
MOJJO
NAZRET
WOLISO
TO JIMMA
AWASH
BURAGE MTS
L. ZWAI
ASELLA
LAKES RIFT REGION
L. ABIATA
L. LANGANO
L. SHALLA
SHASHAMANE
L. AWASA
WONDO
L. ABAYA (MARGHERITA)
KEY
MAJOR ROADS
LAND OVER 2,000 METRES
TOWNS
SITE OF HOT SPRING
MT. ZUQUALA
MT. FANTALLE
MT. CHUBBI.
0 20 40 100
KILOMETRES

springs situated on the fringes and the floor of the Rift Valley, evidence of the fact that water seeping from ground level comes into contact with hot rocks beneath the surface.

At this point in the Awash Valley, the eastern wall of the Rift Valley towers above us in a series of steps caused by faulting. An interesting day's trip from Nazret by Landrover, giving us a closer view of these step-faults, can be had by taking the track to Sire, which leaves the main Asella road on the left-hand side in the village, some ten kilometres beyond the Awash bridge. As we climb out of the Rift Valley, we ascend these steps one by one, finally arriving on a broad flat grassy plateau with the old volcanoes of Mt. Badda and Mt. Chilalo, each over 4,000 metres, rising to the south. The town of Sire itself stands on the edge of one of these faults, two steps below the top, in a fine defensive position, and the flat surfaces of the steps above and below Sire are intensively cultivated in a patchwork of small fields. From the edge of the plateau itself above Sire we can look back and obtain a wonderful panoramic view of practically the whole region which has now been described. To the far right is Fantalle rising from the heat haze of the Rift Valley ; almost beneath us is Bosseti-Gudda, and between these two mountains and the foot of the escarpment below us is the Awash River marked by the lines of denser vegetation following its banks. Behind the mountains the western edge of the Rift rising to the plateau of Shoa can be seen in the distance. To the left, higher up the valley of the Awąsh we can see the rapidly growing waters of Koka Lake impounded by the new dam, and immediately behind is the conical shape of Zuquala. To the far left, the waters of Lake Zwai are just visible and in the far distance the western boundary of the Ethiopian Lake District, formed by the Gurage Mountains, completes the picture.

We will now turn our attention to this region by returning to Moggio via Nazret and taking the road towards Shashamane. We drive first along the new causeway which has been built to take the road above the waters of Koka Lake, leaving Zuquala on our right and noting the large ash volcano, Mt. Bora, with its deeply-eroded gullies, on our left. Now we begin to notice for the first time the flat floor of the Ethiopian Rift Valley for the road stretches in front of us in a series of seemingly endless straight lines, broken only by the crossing of stream beds and points where small faults have fractured the floor of the Rift Valley. Sometimes too we cross the edge of terraces which mark the former extent of the shores of larger lakes once occupying the Rift Valley. The flatness of the landscape and the fact that our view is often obscured by the acacia forests on either side of the road makes the sudden appearance of the hill at Adamitulu a welcome and surprising break in the landscape. This feature, " the hill of cactus," as translated from Gallinya, has given its name to the village which stands at its foot. From the summit of the hill, which is a much-eroded remnant of an old crater, we can obtain a fine view of this section of the Rift Valley. To the north-east is Lake Zwai with its five small islands and to the south the flat floor of the Rift Valley, broken only by two small formations similar to Adamitulu, continues towards Lakes Abiata and Langano. To the east is the line of the small river, Bulbule, which connects Lake Zwai to Lake Abiata and running from the remains of the crater on which we stand is a dyke or line of basalt which crosses the bed of the river and effectively dams the waters of Lake Zwai. In the wet season the overflow from Lake Zwai comes down the Bulbule River and pours over the basalt dam in a fine waterfall. In the dry season the bed of the river below the waterfall is completely waterless but behind the dam is a permanent pond of water for the inhabitants of Adamitulu and for cattle which come from considerable distances. Between this barrier of lava and Lake Zwai, the green grassy banks of the river, shaded by large fig trees, are strongly reminiscent of a peaceful English riverside, although situated in the heart of tropical Ethiopia. It is interesting to speculate how much of the quiet waters of Lake Zwai would disappear if this barrier were to be suddenly ruptured.

Leaving Adamitulu behind as we continue towards Shashamane, we first cross the lower valley of the Bulbule river, passing through the village of the same name, and then the stream which connects Lake Langano with Lake Abiata, and shortly after, the road rises to the crest of an escarpment where we can stop and see these two lakes spread out before us. To the north of Langano and on our left are the eroded remains of the volcano Mt. Alutu which dominate the northern shores of Lake Langano. This region has been the scene of recent volcanic activity marking the dying throes of the old volcano. In 1903, a small eruption resulted in the appearance of a rocky islet close to the northern shore of the lake. On the island and on the shores nearby are a number of hot springs. The northern shores of Lake Langano are much indented and long promontories, much favoured by campers and marking the line of faults parallel to the general trend of the Rift Valley, extend into the lake. One of these fault lines has formed the greater part of the western edge of Lake Langano and as we resume our journey, some twenty kilometres further south, we descend this escarpment and can see it continuing as cliffs along the shores of the lake to our left. Two or three kilometres further on we climb two more escarpments which face in the opposite direction and from the top we can now see the three lakes, Shalla, Abiata and Langano. The flat sections of the road between these fault lines are covered by old lake deposits, an indication of the disruption of the floor of the Rift Valley in comparatively recent times which has been partly responsible for the division (of a much larger body of water) into the three existing lakes. Since this happened, the three separate lakes have also shrunk in size and a close examination of the shores reveals signs of the higher levels of water in previous times. At many points along the shores of Langano the waves from the once higher water have cut niches in the cliffs ; around the shores of Lake Abiata at distances of up to one kilometre from the water, we can see banks of gravel deposited where the shore once stood. Even more impressive are the various terraces around Lake Shalla which mark the gradual shrinking processes. If we take the track to Shalla and, instead of stopping by the hot



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springs where we first reach the lake, we turn left and continue along the eastern shores, the track will bring us to the outlet of a river which rises near Shashamane and flows into the lake. The river has cut down through the beds of material deposited in a larger lake and here we can see something of the story of the various periods of high rainfall and dry intervals which have marked recent geological history in Africa. Bands of darker mud mark the times when silt-laden rivers have poured into the lake and bands of white-coloured salts mark periods of dessication. Climbing back up the terraces and fault-lines to the main road we continue another thirty kilometres to Shashamane

Here we are near the scene of much recent and violent volcanic activity. If we drive on through the town we soon arrive at the edge of a great depression which now contains the waters of Lake Awasa and the smaller Lake Shalla. Even though the country between Lake Shalla and Lake Awasa, through which we have just passed, stands at a higher elevation, it is most probable that in earlier time one vast sheet of water covered the floor of the Rift Valley from Lake Awasa northwards to Lake Zwai. Lake Awasa is however now restricted to the floor of a large faulted basin. To the east and west are the walls of the Rift Valley and to the north and south are transverse and inward facing faults. Within these limits is an area of some 900 square kilometres. Once again the processes of desiccation can be seen in the various shore lines around Lake Awasa and in the separation of a once larger body of water into two smaller lakes. Lake Shalla, the smaller of the two, is now little more than a marsh which becomes a lake only in the wet season. We can explore this area by taking the track which leaves the main road at the southern end of Shashamane. This takes us on a circular trip around the eastern limits of the faulted basin, past the intensively cultivated fringes of the basin where there is a higher rainfall and the plantations belonging to the tomato factory. It eventually brings us back to the main road about 40 kilometres farther south. At short distances of this track to the left along the base of the escarpment are a number of the hot springs which we have come to associate with the Rift Valley.

The strongly marked transverse faults which limit the basin to the north and south are rare phenomena. Astride the northern fault and to the north of Lake Awasa is Mt. Chubbi which is easily reached from the new road connecting Shashamane with Seddu. This seldom climbed volcano is of great interest and well worth the effort of a visit on foot. However, it is unwise, in fact very dangerous, to enter the recent lava fields, even with a compass. The summit was a large crater which has been completely choked by the dome-shaped mass of lava marking the last eruption from the main vent. Looking down from the summit we can see piled on top of one another, in sheets reaching the northern shores of Lake Awasa, the successive flows of lava of different ages. These flows are interesting because they contain a high proportion of obsidian (volcanic glass) which occurs in lumps of most unusual dimensions, often the size of a house. This mass of material must have been a veritable treasure house to prehistoric man inhabiting the Rift Valley, as here he had an inexhaustible supply of material from which he could shape his arrow heads, knives and scrapers.

Although the main vent of Mt. Chubbis is now blocked, a subsidiary cone on the southern side is still in the last stages of activity. The rocks on the rim of this subsidiary crater are hot to the touch and a number of vents emit scalding steam. After storms of rain, when water seeping from the surface comes into contact with the still hot interior of the mountain, the steam from these vents can be seen from a considerable distance and it is put to good use by the local inhabitants who use the supply of heat for cooking food.

From the hot baths of Filowaha in Addis Ababa, the symmetrical beauty of Mt. Zuquala, the volcanic wilderness of the Garibaldi Pass and the rumblings of Mt. Chubbi, we can reconstruct a picture of the powerful forces of nature which have created the landscape in the environs of the Ethiopian Rift Valley and we can imagine early man, whose implements are to be found in abundance in the Rift Valley, looking out on a horizon of smoking cones and fleeing in terror from the sheets of glowing lava and the tremors which cracked the earth at his feet. Today men grazing their herds of cattle and flocks of goats beneath the shade of the acacia trees, and the campers seeking recreation on the shores of these beautiful lakes are part of a peaceful scene which makes a strong contrast with those turbulent times.

Suggestions for further reading:

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The Natural Vegetation of Ethiopia

by Dr. MOONEY

One of the most attractive features of this country is its magnificently varied and interesting vegetation. This presents a few difficulties. In the first place, space is short. Secondly, although many botanists have travelled in Ethiopia during the past hundred and fifty years, it cannot be said that its flora is, as yet, completely known. The third difficulty is to know where to stop in classifying the vegetation and defining types. The latest publication and the first really satisfactory survey of the natural vegetation for the region included in the Horn of Africa is Professor Pichi-Sermolli's *Una Carta Geobotanica dell'Africa Orientale,* which appeared in 1957. He classifies the vegetation under 24 types; but this clearly omits many plant communities. For the purpose of this article I propose to reduce the number to twelve main types or formations. This will allow me to draw a general picture for you without entering into details of purely ecological or botanical interest.

I. In the first place, starting at the bottom in altitude as well as in the stature of the vegetation, we have the **SEMI-DESERT AND STEPPE TYPES.** There is not, in our area, any true desert where the ground is totally devoid of plant growth, except possibly some small areas towards Lake Rudolf and in the Danakil country.

This type is found in Eritrea below the escarpment and towards the Sudan border, in the Danakil and the Ogaden in regions where the annual rainfall is less than 300 mm. and also in parts of the Borana towards Somalia and the Kenya border. It varies from **Steppe** with perennial undershrubs, herbs and grasses through **Semi-Desert and Scrub** where the vegetation consists mainly of an open formation of grasses, ephemeral herbs and low thorny shrubs (including several small Acacias such as *A. bussei, A. mellifera, A. tortilis, A. misera, A. asak, A. orfota, A. unispinosa, Boswellias, including* the frankincense-yielding *B. carteri,* Commiphoras, Grewias and Aloes, a typical showy shrub being *Adenium somalense*); and passes, under slightly better conditions into **Semi-Desert and Acacia,** a community which is similar in many respects but slightly more luxuriant, if I may use that term. Here we find a number of small trees of the genera *Capparis, Cadaba, Maerua, Boscia* (all belonging to the family Capparidaceae), spiny Euphorbias, Boswellias, *Terminalia praecox, Salvadora persica* and succulents such as *Aloe, Sansevieria* and *Caralluma.* The baobab tree (*Adansonia digitata*) is also found in this type and is common in the north-west of Eritrea between Keren and Kassala.

II. The next type in the ascending scale is **SAVANNA,** which must be subdivided into the savanna dominated by Acacias and that in which Combretums and Terminalias are dominant.

The **SAVANNA TYPE** covers a large part of the country and is botanically one of the most important communities in it. It is found extensively in the Rift Valley, the Awash Valley, Dankalia, W. Eritrea, the Borana, Wallega, W. Gojjam and elsewhere. Simplified, its chief characteristic is that it consists of short or tall grasses with scattered small trees mostly under 8 metres high. Sometimes the tree density increases when it passes into woodland, usually **Acacia-Woodland** wherever conditions are more than usually favourable.

In the **ACACIA-SAVANNA,** which is nothing more than a higher stage in the development of the **Semi-Desert** type, we find numerous species of Acacia among which *A. spirocarpa, A. albida, A. seyal, A. senegalensis* are prominent. *Acacia lahai, A. etbaica* and *A. abyssinica* come in at higher altitudes (above 2,000 m.) and better rainfall. Other associates in this type are *Balanites, Dobera glabra, Acokanthera schimperi, Dicrostachys cinerea, Capparis* spp., *Grewia* spp., and many thorny undershrubs of the family *Acanthaceae* (*Barleria, Blepharis,* etc.). Many grasses are represented such as species of *Aristida, Chrysopogon, Cenchrus, Enneapogon, Enteropogon, Latipes Sporobolus* and *Tetrapogon.* Most of them are less than 50 cm. tall.

The **COMBRETUM-TERMINALIA SAVANNA** subtype is widespread in the west in W. Wallega and W. Gojjam but it occurs elsewhere. On the whole, it appears to favour the granite soils. Typical species are: *Terminalia brownei, T. macroptera* towards the Sudan border, *Combretum collinum, C. molle* and *C. ghasalense, Pilostigma thonningii* (yequellawansa), *Stereospermum kunthianum, Entada abyssinica, Protea gaguedi, Faurea speciosa* and *Gardenia lutea.* The grasses are mostly tall, 1-2 metres, or more, *Themeda triandra* and species of *Hyparrhenia* predominating.

III. **THE LOW-LEVEL BAMBOO FOREST.** The *shemel* bamboo (*Oxytenanthera abyssinica*) covers extensive tracts in W. Wallega, W. Gojjam and in the Taccazze Valley at altitudes of 1200-1600 metres where the rainfall is mostly about 500 mm. It occurs in almost pure stands over vast areas west of the Didessa R., but

especially in the valley of the Dabus towards Bombashi and Asosa, where it occupies an area of approximately 500,000 hectares. This bamboo is suitable for the manufacture of paper-pulp and I have estimated that the forests of Wallega could produce at least 150,000 tons of paper annually on a sustained basis. This type is occasionally interspersed with the **Terminalia-Combretum Savanna.**

IV. **MONTANE EVERGREEN SCRUB.** This type occurs mainly along the top of the escarpment in Eritrea, Wollo and Harrar at about 2,200-2,300 metres in a rainfall of 700-800 mm. and consists chiefly of small trees and shrubs such as *Acokanthera schimperi* (kararo), azanir (*Bersama abyssinica*), atkwar (*Buddleja polystachya*), wansa (*Cordia abyssinica*), bisanna (*Croton macrostachys*), kalquol (*Euphorbia candelabrum*), irba or segid (*Lachnopylis congesta*), weira (*Olea chrysophylla*), and shrubs such as agam (*Carissa edulis*), kellau (*Euclea schimperi*), kombolcho (*Maytenus* spp.), kitkitta (*Dodonea viscosa*), imbatcho (*Rumex nervosus*), grawa (*Vernonia* spp.), abaliye (*Maesa Lanceolata*), kachamo (*Myrsin africana*), gombobela (*Sideoxylon oxyacantha*), degitta (*Calpurnia subdecandra*), limitch (*Clausina anisata*), several species of *Rhus* and *Rhamnus*. The type is widespread and passes imperceptibly into the **Temperate Forest and Grassland,** of which in some cases it seems to be a subclimax.

V. **THE TROPICAL RAIN FOREST** occurs in the western provinces of Kaffa, Illubabor, S. Wallega, Gamu-Gofa and parts of Sidama where the rainfall exceeds 1,200 mm. but especially in the 1,500-2,000 mm. zone between Jimma, Bonga and Gore. The Sai Forest, between Bonga and Gore is the most extensive area of this type. It is characterisd by high forest of two or three storeys, the dominants attaining a height of 40 metres with dense evergreen underwood and undergrowth. The principal trees found here are kararo (*Aningeria adolfi-friederici*), butugi (*Manilkara butigi, Bosqueia phoberos, Morus mezozygia*), kummel (*Mimusops kummel*), sassa or ambabessa (*Albizia gummifera,* etc.), sombo (*Eckebergia rueppelliana*), tukur-inchet dokhma (*Sysygium guineense*), amalaka (*Celtis kraussiana*), karshimbo (*Polyscias ferruginea*), bisanna (*Croton macrostachys*), birbira (*Millettia dura*) and many others. In the lower storey smaller trees such as *Teclea nobilis, Galiniera coffeoides, Dracaena steudneri* and shrubs like Wild Coffee, *Dracaena afromontana, Acanthus eminens* and the tree-fern *Cyathea manniana.* There are many large climbers, notably species of *Landolphia,* which yields a rubber latex; numbers of shade-bearing herbs such as kororima (*Amomum cororima*); while the trees are usually festooned with mosses, epiphytic orchids, ferns, club-mosses such as *Lycopodium saururus* and species of *Peperomia.*

A number of economically valuable timber trees are found in the Tropical Rain Forest but so far they have not been exploited commercially.

VI. **THE TEMPERATE FOREST AND GRASSLAND.** Although now much reduced in extent, this community still comprises the most valuable timber forests, which at one time covered the greater part of the central highlands and the northern plateau of Ethiopia. In it occur two valuable timber trees: *zigba* (*Podocarpus gracilior*) mainly between 1,500 and 2,200 metres and *tidh* or juniper (*Juniperus procera*), also known as the "Pencil Cedar," mostly between 2,200 and 3,300 metres. These two species often form pure or almost pure stands, as in the Wofasha and Mogado forests, but they also frequently overlap. Both require a rainfall of 700-1,000 mm. to reach their best development but the *tidh* is less exacting and grows in regions of as little as 500-450 mm. as at Yavello and Mega.

The *tidh* tree, which attains a height of 45 metres and a diameter of more than one metre in the Wofasha forest near Debra Sina, occurs throughout the highlands of Ethiopia and most certainly covered much of Shoa, most of the northern provinces and Eritrea with dense forest in former times. It still occurs on the upper slopes of the escarpment in Eritrea; through Tigre, Begemder, Wallo and Gojjam—mostly in the form of small copses and isolated deformed trees; in Harrar where it is still abundant in the Chercher mountains; in Shoa, as in Wofasha, Managasha and the much damaged Jem Jem forests; in parts of Arussi; in the Araenna mountains of Balé between Dodola and Goba; in Sidamo at Irgallem, Neghelli and Yavello, where it stops except for a small outlier at Mega. It occurs in the west of Shoa and just enters Kaffa across the Gibbie river at Botor and Lajim. The present site of Addis Ababa occupies what was formerly a juniper forest.

The most frequent associates of *tidh* are weira (*Olea chrysophylla*), sombo (*Eckebergia rueppelliana*), tukut-inchet (*Pygeum africanum*), donga (*Apodytes dimidiata*), birbira (*Millettia dura*), bisanna (*Croton macrostachys*) and chat (*Catha edulis*), this last mostly in the Chercher but also elsewhere as on the limestone at Neghelli-Sidamo. At higher levels, sometimes with but more often above the *tidh* between 2,700 and 3,300 metres, kosso (*Hagenia abyssinica*), gatema, amedjha (*Hypericum lanceolatum*), tulen (*Rapanea rhododendroides*), *Gnidia glauca* and asta (*Erica arborea*) come in. Here the trees are often draped in lichens (*Usnea* spp.).

The *zigba* forest occurs below the level of the *tidh* but does not extend into the drier parts of the country, nor is it found in the northern provinces or Eritrea. The best examples of this sub type are to be seen at Shashamanné, at Wadera and Adola, in the Mogado forest near Agheremariam and in the great forest which stretches southwards from Goba towards Dallo and Adola. It also occurs in the Chercher range, in Wofasha and Managasha but, since it occupies the lower ground it has been much affected and in some places exterminated by the extension of cultivation. It extends a short distance west of Jimma where it is scarce and soon gives way to the Tropical Broadleaved Rain Forest. Its last outposts in the south are at Mogado and Arero. The *zigba* is a very fine tree up to 50 metres in height and not infrequently 2 metres or more in diameter. The timber is much in demand.

Common associates of *zigba* are *tukur-inchet, dokhma, bisanna, sassa, sombo, ankissa* (*Polyscias ferruginea*), *birbira, azanir* and, especially in S. Balé, *kararo. Teclea nobilis* and *Olea milbraedii* are found

in the moister types, while species such as *weira, korch,* and *donga* are more frequent in the drier forests.

Grassy Glades are a frequent feature of these upland forests. Good examples are to be seen on the upper limit of the *zigba* between Shashamanné and Kofolé in Arussi, in the *zigba* forests south of the Araenna Mts. and in the *tidh* forests around Goba. Some of these glades may be natural but most of them are most certainly the outcome of shifting cultivation or even more often the result of clearing and burning for pasture, a process which is still all too active in Balé. Along the fringe of the forest bordering these glades certain species are common such as *korch, gatema, kombolcho atkwar, irba* or *segid* (*Lachnopylis congesta*) and shrubs like *Acanthus arboreus, A. sennii, grawa* and giant thistles such as *Echinops ellenbeckii* and *E. giganteus.*

VII. **THE HIGH-LEVEL BAMBOO FOREST.** The *karkaha* bamboo, *Arundinaria alpina,* flourishes mainly between altitudes of 2,600 and 3,000 metres in the provinces of Shoa, Kaffa, Gamu-Gofa, Balé and Sidamo. Good examples are to be seen near the summit of Mt. Jibat near Ghedo and at Aghere Salam in Sidamo, the latter being privately owned and worked by the villagers. The only extensive area of this type I have seen is on the southern side of the Araenna Massif in the upper catchment of the Ganale Doria, three days march from Dodola. It also occurs in moderate abundance in the hill forests near Kofolé and Koré in Arussi. This bamboo usually forms pure crops but the following may be found with it especially towards its upper limit: *amedjha, gatema, tulen, dokhma, atkwar* and *asta.*

VIII. **THE AFRO-ALPINE COMPLEX.** We now come to what is by far the most interesting type of vegetation in the country, namely the **Afro-Alpine.** It may be subdivided into **Montane Scrub, Montane Steppe** and **Scree;** but for our purpose I shall deal with the community in a generalised way. It occupies the upper slopes and summits of the highest mountains and begins above the *kosso-amedjha-tulen Association* at about 3,300 m. (11,000 ft.) more or less depending on the latitude and other factors. It covers large tracts in the Semien Mts. of Begemder and Tigré, the Choké Mts. in Gojjam, Mts. Chilalo and Kaka in Arussi, Mt. Gugu in Harrar and the Araenna massif in Balé. It is also represented in the Amaro and Guraghe mountains between the Rift Valley and Kaffa and in the group between Debra Berhan, Debra Sina and Ankober which culminates in Mt. Wuti.

These mountains have a flora peculiarly their own but common in many of its features to the floras of all the high mountains of East Africa. The formation is best seen at altitudes above 3,500 metres (11,500 ft.), whence it extends up to 4,000 m. (13,100 ft.) before giving way to **Steppe** and, finally, at over 4,400 m. (14,400 ft.) to **Scree.**

My own knowledge is confined to the southern mountains, to the Debra Sina group, Mts. Chilalo and Kaka in Arussi and to the Araenna tableland in Balé. Dr. Hugh Scott's papers on the Semien and Guraghé Mts. and Pichi-Sermolli's description of the Semien conform closely to what I have found south of the Rift Valley. If anyone wishes to study these communities within a reasonable distance of Addis Ababa I recommend him to go to Goshmeda or Kundi, which are easily accessible from Debra Berhan. Mt. Wochacha is just not high enough.

Briefly, the vegetation is characterised by *asta* the Giant Heath, *giberra* or the Giant Lobelia (*L. rhynchopetalum*), a great number of Immortelles or Everlastings (*Helichrysum* spp.) locally called "natchilo" and many Alchemillas. There are no trees. The *asta,* which can attain a height of 8 m. rarely exceeds 2 m. due partly, no doubt, to the altitude but even more to the fact that it is cut and burnt by the shepherds. This Giant Lobelia, which I have seen growing at 4,300 m. (14,200 ft.), is endemic to Ethiopia, although other species of Giant Lobelia occur on other mountains in East Africa and even in the Cameroons in W. Africa. This remarkable plant—a giant herb with a soft hollow stem—attains as much as 8 m. high when in flower. It flowers about once in fifteen to twenty years and then dies. Several species of *Senecio,* notably *S. myriocephalus,* are common but the Giant Senecios or Tree Groundsels of Mts. Elgon, the Aberdares, Mt. Kenya, Ruwenzori, the Virungas and Kilimanjaro have not been recorded.

I shall not here present a full list of the plants that have been recorded in this type but a few may be mentioned. There is one Anemone (*A. thompsonii*), a number of Swertias of the Gentian family, a beautiful, large, pink Pimpernel (*Anagallis serpens*), a couple of Bartsias, a Saxifrage (*S. hederaefolia*) and several Umbels including *Oreophyton falcatum* which was collected up to 4,300 m. on Mt. Dimtu. *Landtia rueppellii* is a very common Composite at these high altitudes and *Ranunculus oreophytus* is a common and conspicious herb in April; *Veronica beccabunga* is frequent in moist ground. A Chamomile (*Anthemis tigreensis*) was collected on the summit of Mt. Dimtu at 4,450 m., the highest peak in southern Ethiopia, together with *Arabis alpina*—a plant which extends to N. Europe. *Sanicula europaea,* the Sanicle, is found in shady spots usually towards the lower margin of the Montane Scrub. The woodrush, *Luzula johnstonii,* is frequent in damp ground under shade and there are several sedges, the most typical being *Carex monostachya.* Of the grasses, I may mention *Deschampsia caespitosa,* which occurs on the moors in the British Isles and N. Europe. It is common here too on moorland at around 3,600-3,700 m. *Agrostis quinqueseta, Festuca schimperiana* and *Pentaschirtis pictigluma* are frequent in this formation; but the commonest and most characteristic grass is *Koeleria cristata,* which grows right up onto the Scree to the summit of Mt. Dimtu and to the top of Ras Deghien (4,620 m.) in the Semien.

There are many Helichrysums, the most typical being *H. citrispinum, H. Hoehnelii, H. splendidum, H. formosissimum* (rare above 3,300 m.) and two new species as yet unidentified.

Besides these eight main types (most of which should be further subdivided) I must mention the **Riparian Forest,** the **Coastal Vegetation,** the **Mangrove Swamps** and the **Marshes.** These all form very clear types but they usually occupy small areas and are not well known.

IX. **THE RIPARIAN FOREST** is a complicated community which could be subdivided into several quite distinct types largely depending on altitude, with which temperature is connected, and varying edaphic requirements. In other words, the vegetation you would find along the lower reaches of the Ganale Doria and Dana Parma at Dolo on the Somalia boundary, where the Dom Palm (*Hyphaene benadirensis*) forms large colonies, would be quite different from what would be found on the banks of rivers in the highlands of Arussi or Sidamo. The riparian vegetation of the Blue Nile and the Tacazze R. would, again, be quite different. Willows (*Salix subserrata*), reeds such as *Phragmites communis* and the palm *Phoenix reclinata* are often found in these "Gallery Forests." Another species of Dom Palm, *H. nodularia,* forms groves along the dry river-beds in W. Eritrea .

X. **THE COASTAL VEGETATION** consists of plants capable of resisting alkaline and sandy soils such as species of *Atriplex, Suaeda, Salsola, Zygophyllum, Calotropis procera, Hyphaene dankaliensis* and *H. reptans,* with a number of wiry, hardy undershrubs (e.g. *Indigofera* spp.) herbs and grasses.

XI. The **MANGROVE SWAMPS** are a thing apart but extremely local. They are found along the shores of the Red Sea, the Gulf of Aden and the Indian Ocean. As far as we are concerned, they are restricted to a few spots near Massaua, Assab and Zeila. They grow in tidal mud and form low, often dense, thickets. The principal species belong to the genera *Brugiera, Ceriops, Avicennia, Sonneratia, Rhizophora, Lumnitzera, Xylocarpus* and *Heritiera,* many of which are common to the coasts of India, Malaya and West Africa.

XII. **THE MARSHES.** The vegetation of the marshes is, as one might expect, characterised by aquatic plants. *Aeschynomene elaphroxylon* is a small tree; other species of *Aeschynomene* and *Sesbania* are tall slender leguminous shrubs or herbs. There are three species of Reedmace or Bulrush (*Typha* spp.); and the tall Reed, *Phragmites* is common. The Papyrus (*Cyprus papyrus*) is often dominant over large areas. Water-lilies (*Nymphaea* spp.) and many species of sedges and aquatic herbs and grasses go to make up this community.

I have not, so far, been able to study the marshes but there are several, large and small, in the country both on the plateau such as the large swamp at the source of the Dabus R. near Ghidami and the Kioman Swamp north of Ghedo, and also towards the coastal plain as in the lower reaches of the Awash R. in the Danakil.

(continued at foot of next column)

Zuquala

by DOROTHY OBI

Zuquala, Guardian of Addis Ababa, ancient as the
molten volcano that formed you
In a day beyond our memory's comprehension,
New as the youngest grass blade on your slope,
Crowned with a crystal lake of water reflecting the sun
and shadow of the heavens,
Girded with great boulders among which perch the
Church and the Monastery of our fathers:

From you, Zuquala, we inherit our strength.
Upon your rocks our feet are sure, our hearts undaunted;
We stand at your rim and behold a dawn beyond time
and space, sun-dazzling.
Beneath our feet pulses your passionate past,
A past when men used you for a trial of truth—
Daring the false-hearted to pass between your stones,
Daring the liar to seek Zuquala's judgment.

As a mother nurses her child with songs of heroes, so
you have brought us up to manhood;
As a father you have enclosed our home with a trusty
wall and planted within it a garden of Eden . . .
And you stand as a guard at the gate.

We shall write with our thoughts on scrolls of lasting
parchment,
Illumine our manuscripts with colours the spirit
proposes:
(Prophets and rulers of a realm that stretches from the
molten fires of antiquity to the moving waters of
the future)
Proof of thy parenthood, Zuquala.

(continued from preceding column)

It will be appreciated that this article is no more than a brief sketch of the vegetation of Ethiopia. The flora of the country is extremely rich owing to the great diversity in climate and topography. When you consider that the altitude varies from sea-level to 4,620 m. (over 15,000 ft.), that the rainfall ranges from less than 100 mm. annually on the sea coast with its dry, torrid climate to as much as 2,000 mm. in the west of Kaffa with its mild tropical temperatures or to the higher mountains where conditions are mild and temperate, it is scarcely surprising that immense variations occur in the vegetation which has to adapt itself to these extremes of climatic and edaphic conditions. Consequently the flora is very rich indeed. What the total number of different plant species is is impossible to say but I would hazard a guess that it is between 8,000 and 10,000, and it may possibly be even more.

Geography Notes

by RICHARD GREENFIELD

PUBLIC LECTURES ON THE GEOGRAPHY OF ETHIOPIA

This part of the programme of the Geography Society has been the most successful to date. It was decided that the first programme of lectures—some of which are published in this edition of "Ethiopia Observer"—should be a general cover of the Geography of Ethiopia, and that subsequent lectures might deal with some specific topics or areas.

The titles of the nine lectures are very varied, and they reflect the nature of Geography, it being an approach to knowledge, rather than a narrow discipline. Geography takes the findings of many allied sciences and endeavours to present a synthesis, often in terms of a region. The historian may look at the region from the view-point of time, and the geographer from the view-point of space. It is pertinent therefore for the geographer to consider the geology, climate, natural vegetation, peoples, and economic potential and development, but also to see the region in its broader setting.

The first lecture in the series, given by Mr. Greenfield was on Ethiopia and Africa. It was meant as an introduction to the series as a whole, and examined the position of Ethiopia in the terms of the broader study of African geography. Mr. Greenfield discussed the many factors in Geography and showed slides comparing and contrasting people, economic development and the scenery of Ethiopia with those of neighbouring African countries.

Dr. Paul Mohr gave the second lecture on the Geology of Ethiopia. Dr. Mohr has now left the University College and is working at Sheffield University in England. He wrote to the Secretary stating that his article was already somewhat dated, but we have



Photo : Richard Greenfield

THE MOUNTAIN ROAD TO ASMARA

Near Alemata the road from Addis Ababa to Asmara ascends the wall of the Rift Valley.

decided to publish it because of its general soundness as an all-round survey. Dr. Mohr, we know, would be only too delighted if his lecture should provoke young Ethiopians to more work in the field, thus dating his paper still further !

Eng. V. Licitzyn, Director of the Climatological Institute, Addis Ababa, discussed the Climate of Ethiopia and answered many questions. Valuable contributions were made to the discussion after the lecture by Dr. Gouin, Head of the Geophysical Observatory.

The fourth lecture, on the Natural Vegetation of Ethiopia, by Dr. Mooney, Forestry Advisor, British Middle East Development Division, was, like Dr. Mohr's lecture, an outstanding contribution to our knowledge of Ethiopia, and the Society is grateful to " Ethiopia Observer " for its publication in this edition.

Mr. George Savard spoke on the peoples of Ethiopia. He outlined the various movements of peoples, and the growth of their knowledge of agricultural and other skills, before moving on to a most interesting section on what all the many varied peoples of Ethiopia have contributed to the identity of the Ethiopian personality.

The lecture on the agriculture of Ethiopia was given by Mr. Rouk, Director of Research at the Imperial Ethiopian College of Agriculture at Alemayu. Mr. Rouk spoke on the present position of Ethiopian agriculture, in particular coffee, and outlined, in reply to questions, the manner in which production, grading and general standards are being improved.

Industry in Ethiopia was the title of the lecture given by Eng. Econ. Vladimir Zerjavich, Industrial Advisor to the Imperial Ministry of Commerce. Eng. Zerjavich analysed the patterns of the development of industry in Ethiopia, and went to great trouble in preparing visual aid materials—graphs and diagrams—to illustrate his arguments.

Mr. G. C. Last, Chairman of the Geography Society, gave a lecture on the power resources of Ethiopia, and this lecture is printed in this copy of the Observer.

The last lecture in the series was given by Ato Messfin Wolde Mariam, and it was entitled " Complex Ethiopia—a study in political geography." Ato Messfin studied geography in India and at Clark College in the United States before returning to Ethiopia where he worked for some time at the Mapping and Geography Institute until he joined the staff of the Geography Department of University College. Ato Messfin's lively manner of presentation and the knowledge that he would not shirk from drawing conclusions from his facts, however controversial, made this lecture a fitting end to the first series. A good omen for the future was that it attracted many people who had not previously attended the lectures.

(An important article by Ato Messfin on the Population of Ethiopia is to be found in Vol. V No. 2—Note, Editor, *Ethiopia Observer*).

The present year has, for a number of reasons, beyond the control of the Society, been a little more disturbed, but we were pleased to hear the Librarian of the University College, Mr. S. Chojnacki, read a paper on the early explorers of Ethiopia, Mr. Kurt Roselius, of the Haile Selassie I Secondary School, spoke on the islands of Lake Zwai. He described how settlement on these islands had taken place in somewhat troubled times in the history of Ethiopia, and with slides was able to give his audience a clear picture of the almost Far-Eastern density of population and distribution of the meagre land resources on the islands of this beautiful lake.

The last lecture this year was perhaps the highlight of the whole series : Mr. Martin Johnson, a National Science Foundation Research Scholar, gave a slide illustrated lecture on the Geography of Addis Ababa. So great a crowd attended this lecture that it had to be transferred to the College dining hall.

The Society hopes to arrange more lectures after the College long vacation, and is very grateful to the University College for the facilities which have been offered.

THE METAHARA DISTRICT

Members of the Geography Society have made several trips to the recent volcanic region of Metahara in Ethiopia.

24 kms. after Nazareth a barrier is passed and soon the road winds through much recent lava. 31 kms. further brings one near to the crater of Winzegoor. Very few people are aware of the existence of this great crater which rivals the great crater of Menengai near Nakuru in the Kenya Rift Valley. It is approximately one kilometre to the rim of the crater across grass and woodland to the left or north of the track. From here a splendid view over the recent lavas is obtained.

The crater was first noted by Harris, who was the first European to travel through this region. He writes: ". . . the crater of Winzegoor, from whose monstrous caverns the entire adjacent country has been recently overflowed." Buxton writes that these erupted last about 1810, but this is based on Harris, who is actually nowhere near so pedantic. Harris writes that " the fact that there had been no active volcano for more than 30 years was confirmed by all around;" his visit was in 1842.

The track here has a very bad surface, and except for the more adventurous, is only really feasible in 4-wheel drive vehicles. Two kms. beyond this point the road threads its way along a much lower part of the Winzegoor crater rim between a line of great cinder cones which probably mark the last phase of activity of a fissure eruption. A similar, though smaller caldera is passed, containing what was once a lava lake, now covered with scant bush and tree vegetation. This is five kms. beyond the high rim of Winzegoor, and is marked by a column as " the Garibaldi Pass." These features may be the result of a type of cauldron-subsidence.

Thanks to the courtesy of General Assefa, Commandant of the Ethiopian Imperial Air Force, an aeroplane was placed at the disposal of members of the University College staff. This whole area was cursorily explored. There are a tremendous number of small lava

and cinder cones, and enormous stretches of very recent lava. In places the floor of the rift is faulted and bubbles are raised upon it whose hollow inside contain sulpherous deposits. The higher shore lines of Lake Metahara are visible, especially on the southern side, but these bubble features may not be due to gaseous explosions through the lake, since members of the Kenya Geological Survey have discovered similar features on the flanks of Kilimanjaro. From the air it appears that vast areas of the Rift floor, as far as Mount Assebot, was lake-bed in Pluvial times. A very fine new Monastery is being built on the rim of the denuded crater of this Pleistocene volcano.

One of the great problems teasing Harris' mind was whether or not the magnificent Rift Valley volcano of Fantale was active. He writes that he could never overcome the timidity of his guides sufficiently to entice them to visit the volcano. Mr. Last, in his article in this issue, rightly states that the mountain has not been properly explored. However, it is possible to state that its vast caldera contains lava as recent, if not more recent, than that which has flowed in a black streak on the landscape down towards Lake Metahara. The caldera is not full of lava, and it is heaped round small cones, and some even appears to have erupted from the wall of the caldera. The view at 4.00 p.m. from the aeroplane showed several columns of steam rising from the lava.

Continuing, by road it is possible to avoid the lava flow from the subsidiary cone, which flows to Lake Metahara, and a very bumpy cross-country ride by Landrover brings one to the shore. The most remarkable thing about this lake, as Buxton mentions, is the number of flamingo. The Secretary of the Society believes that there are more flamingo in this lake than in the famous Nakuru Lake in Kenya. Even more interesting is the fact that due to the shallow nature of the lake it appears almost certain that this is one of the rare breeding grounds for flamingo. In May this year the shores were a dense pink, and Greater and Lesser Flamingo were abundant in vast numbers. These flamingo, in considerable, though lesser numbers, are to be found also at Lake Abiyata, further south in the Rift Valley. There also the field glasses lead one to the conclusion that shallow breeding islands exist in the lake.

Harris writes of rhinoceros round Lake Metahara, but it is very dubious if any of these have survived. Wild pig, however, of considerable size, are common, and could be dangerous if one walked through the high grass. They can be seen on the northern shore drinking at most times of the day.

The road beyond Fantale continues to the little settlement of Awash Station and on to Dire Dawa. A new road is being constructed on the top of the escarpment which will link the Harar-Dire Dawa road with the little township of Asba Teferri.

LAKE HORA

The Secretary of the Society would be interested to hear from anyone who has heard of any early traditions concerning witchcraft or the like which involve this lake.



Photo : Richard Greenfield

LAKE METAHARA

This lake is a drying lake of the Rift Valley. Ancient shore lines show its former extent. At certain times of the year it is the home of the Greater and Lesser Flamingo, and is almost certainly one of their rare breeding grounds.

MOUNT CHUBBI—A VOLCANO ON THE NORTHERN SHORE OF LAKE AWASA

The discovery of the volcanic activity in the Mount Chubbi region makes an interesting story. Members of the University College Geography staff made several visits to the Lake Awasa region. Tales of the mountain glowing red at night, of ash falling on Sheshemane during the Italian occupation period, of rumbling and earth tremors, were quite common. Mr. Tiffin, senior Geography master at the General Wingate School then added to the picture with the information that one of his students had been taken as a boy to a place some miles from Sheshemane to throw rocks into a hole in the ground " to contain the devil."

A number of attempts to climb Mount Chubbi by Dr. Mohr, Mr. Dean and Mr. Greenfield from University College were unsuccessful, since they approached in the main from the Lake Awasa side. However, with the co-operation of the Imperial Highway Authority it was possible to approach from the North, from the new Soddu road, and hot springs on the flank of the mountain were observed. Mr. Dean and Mr. Greenfield pushed on through heavy rain to the subsidiary crater, discovering a number of fumeroles and a large steam-vent. The rim of the crater was frequently too hot to hold and rocks just under the surface were intensely rotted by the steam.

On that day, the rain-storm having just stopped, the whole obsidian cap of the mountain steamed as the rain percolated to lower and hotter rocks. The head of the Highways Department at Sheshemane had been under the impression that the steam was—seen from Sheshemane—the smoke of tuqals.

The Geophysical Observatory in Addis Ababa has for some time recorded local earthquakes some 200 kms. south from Addis Ababa, which may quite likely emanate from the Chubbi region. Here fault lines cross the Rift Valley : to the west their throw is to the north, but to the east, it is to the south. Chubbi itself lies on the junction, and it may be understood that this is an obvious region of instability.

Only one week after Mr. Dean and Mr. Greenfield had located the subsidiary cone and crater, which is the centre of activity, Ato Worku, head of the Highways Department in Sheshemane, set off for the mountain. Halfway up he had difficulty in standing as a local but severe earth tremor shook the mountain. Ato Worku reported that the local people sacrificed goats on these occasions. On being invited to visit the mountain again, Ato Worku politely but firmly declined, and was in fact so shaken that he got married the next week. We believe he has now left Sheshemane and the Geography Society wishes him long life and no earthquakes, wherever his job now takes him. (At the moment of writing, Addis Ababa is being rocked by earthquakes.)

Several subsequent visits to Chubbi by University College students, and one by Messrs. Last, Chambers and Relton, guided by Mr. Greenfield, indicate that the mountain is in the last phase of volcanic activity, but one can never be too sure, especially when a mountain is capped by such a dome of lava.

The lava of Chubbi is obsidian in the main, with pumice and cinder. Blocks of riolite have been found, but not *in situ*, and they present rather a mystery.

The lower levels of the mountain are composed of tuff and ash, sometimes containing small black crystals of obsidian—perhaps the remains of early explosions.

The great lava fields contain enormous blocks of obsidian and are very dangerous. Anyone visiting Chubbi, is strongly discouraged from entering these fields, since the lava is fragile, its edges are very sharp, and its tousled nature is such that it is very easy to lose one's way and sense of direction.

EXCURSION TO CHININA

The Secretary and the Chairman of the Geography Society of Addis Ababa drove last January to the Chinina escarpment which overlooks the upper waters of the Webi Shibelli.

If there are no mechanical difficulties, and the weather is good, it takes approximately eleven hours by Landrover from Nazareth. The route is to follow the main road from Nazareth towards Asella until the river Awash is crossed. Some few kilometres further on one takes the second turning on the left in a village (the first turning leads to the police station), and a dusty unmade track crosses the very dusty Gillé plains towards the eastern escarpment of the Rift Valley.

The volcanic tuff is eroded into quite fantastic shapes, and a number of cemeteries are passed in the bush. A small river has to be forded, since the bridge is unsafe. The Rift escarpment is characterised by four step faults, and settlement is frequently found on the slopes themselves. The town of Siré is half way up the escarpment on a step fault.

At the head of the escarpment the track soon disappears into a number of trails across the grassy Arussi plateau. A fine view is obtained to the southwest of the Chilalo mountains, two large volcanoes rising from behind Asella. The saddle between them, seen from the plateau, is considerably larger than it would appear from Asella. Hail sometimes lies on the upper slopes of these mountains.

Settlement has increased considerably on the Arussi plateau over the past ten years, and where wheat and barley and other crops are grown the produce seems very good, but the plateau is largely grassed and not tilled.

After some hours of driving, gorge-like heads of south-flowing rivers are passed and the typical scenery of the Ethiopian plateau ensues. The town of Cholé can be skirted to save time and the track, now better defined, approaches a third great volcano, Mount Gugu.

Mount Gugu would seem to be aligned with the Chilalo volcanos, though it is very far from them. It is probably older than the volcanos at Asella, since no crater remains, but rather a ridge, like that of the beautiful Yarrer volcano near Debra Zeit. The volcanoes probably represent the last phase of activity of Tertiary times when the Trap basalts were extruded.

Near to the mountain there are a large number of piled stone cairns, part grassed over. Some of them have large trees growing through them, indicating their antiquity. Local Galla informed the Secretary that they were built in the reign of a king who ruled Ethiopia prior to the invasions of Mohamed Grañ. However, the Galla were not then in this area, so this information is scarcely reliable, except that it may indicate that they were there prior to the Galla movements on to the plateau after the Grañ invasions.

To the east of Mount Gugu the edge of a great escarpment is reached above Chinina. The view is probably without parallel, even in Ethiopia. The escarpment stretches to the north-east and to the south and is considerably fretted by the headwaters of the great drainage courses which run down to the Manya river which flows into the Derbar and then to the Webi Shebelli. The plain is a very wild and unpenetrated region and on a clear day the visibility is quite tremendous.

The escarpment is probably the eroded edge of a fault line. Basalt is exposed in parallel flows and Mount Gugu is clearly seen to be a subsequent volcano formed on top of the massive basalts. The large number of basalt flows rest on red tuff and sandstone and caves are not infrequent. Limestones and sandstones are exposed on the plain and there are signs of cinder cones and later volcanos.

It is here, towards the foot of the escarpment, that M. and Mme. Baumgartner have their farm. This Swiss couple have lived in Ethiopia for fifty years, many of them at Chinina. After the second World War they lived there with their daughter for ten years without seeing another European. M. Baumgartner informed the Chairman and Secretary that there is much evidence of Galla terracing in the region which was abandoned in the last century. This would make an interesting study, though there is always a possibility that successive basalt flows, after erosion, could give the misleading impression of terracing. M. Baumgartner maintains that down in the Manya plains where very few people have travelled since it is hot and inhabited by lion and leopard, there are the remains of the foundations of

paved roads; there are tesselated pavements with stone sculptures or drawings, including the "fleur marguerite." He maintains that these might have been constructed by the Portuguese, but this seems most unlikely. It would need a sizeable expedition to travel several days into the Manya country to examine these remains, and only then could we know their true nature. If one were to speculate, which is dangerous, one's mind turns straight away to the ancient kingdom of Punt.

NEW ROAD FROM ADDIS ABABA TO GONDAR THROUGH GOJJAM

With recent highway development, the Secretary is able to announce that this route is now feasible for 4-wheel drive vehicles.

The all-weather road from Addis Ababa to the Blue Nile Gorge and thence to Debre Marcos (305 km) is suitable for any vehicle. There is generally petrol at Fiché, off the road, and an Agip station is being built at Dejen on the Gojjam side of the Gorge. Petrol is available at Debre Marcos.

After the escarpment of the Entoto Ridge, which is undoubtedly connected with the Ethiopian Rift Valley and the fault line at Ambo, the road passes over the sometimes quite hilly surface of the plateau. In places the flat deposits left by lakes which existed in the Pluvial or Ice-age period are still swampy. Glimpses of some of the great gorges—tributary to the Blue Nile—are obtained at a number of points, particularly near Debre Libanos, and here and there great volcanic necks rise above the general surface. These mountains are all that remains of some of the enormous volcanoes which existed in Tertiary times and which were no doubt partly responsible for the sheets of basalt and other lavas which form the plateau.

The following kilometre readings may be useful though recent road shortening may mean a 1 to 2 km error.

Addis Ababa, Trinity Cathedral 0
Summit of Entoto Pass 9
Turn-off to the left (west) for Mulu farm and Community Centre 37
Sululta village 39
Further villlages at ..... 77, 82, 87 and 99
Turn-off for Debre Libanos (4 km) where a new cathedral is being bult by Bolton & Henessy to house the ancient tomb of the Saint Tekle Haimanot 100
Small track to right (north) to the so-called Portuguese Bridge, which was built, according to the local people by two prisoners taken at the Battle of Adoua. In Douglas Busk's book "Fountains of the Sun" is a different story (which I have no evidence against) that it was built by the grandfather of Ras Kassa. The one certain thing is that the bridge was not built by the Portuguese 101
Turn-off to right (west) to Fiché (5 km) 115
Villages ..... 155 & 184
The top of the southern side of the Gorge 187
The transition from the basalt to the limestone which lies below it 192
A village 195-197
Two old Italian field guns—remaining from the battle fought across the Gorge at the re-occupation of Ethiopia—on a bank at the left of the road 202



Photo : Richard Greenfield

A GREAT VOLCANIC NECK IN BEGEMDIR

In many parts of Ethiopia there are mountains with very weird and unusual shapes: for example, the Simien and the mountains of Adoua. These mountains are often the remnants of the volcanic pipes up which the basalt lavas flowed. These pipes were baked harder than the surrounding rocks and are more resistant to erosion. This one is passed by the new road running from Bahr Dar round the east side of Lake Tana to Gondar.

Limestone in the Gorge becomes successively marly and red in colour and can be termed sandstone from 204
The great red sandstone cliffs are at 205
Bridge linking the ancient kingdoms of Shoa and Gojjam 209
Debre Marcos 305

The view from the northern or Gojjam side of the Blue Nile Gorge towards Shoa is even more formidable than the view previously obtained. The plateau of Gojjam resembles in many ways that of Shoa, but the absence of eucalyptus strikes one immediately. The same ancient lake beds exist, and the soil is often redder, thicker and less stoney than in Shoa.

From Debre Marcos towards Burei (112 kms) there is a good all-weather road suitable for any vehicle, except that the road is unmade for the last kilometre up to Burei, from the hot spring in the valley. This hot spring, now used to water cattle, is described by the local people as being once the property of the king.

The track to Bahr Dar (162 km) branches off just before the end of the made road in the Burei valley. It is very bad on leaving Burei for several kilometres, and many timber bridges are partly collapsed. Four-wheel drive is necessary in any weather on this route, and although the kilometrage is small it takes at least one day's driving. There is usually Agip petrol at Bahr Dar, but on April 14, 1961, they had run out.

The track to Bahr Dar passes very close to several spectacular volcanic necks. In many places cinder cones and lava fields of quite recent date are skirted. It has been the custom in studying Ethiopia to divide the volcanic episodes into (1) the Trap Series of Tertiary times and (2) the Aden Volcanics of much younger times, found in the Rift Valley and on the southern shore of Lake Tana. However, this distinction, which was introduced first by Blanford, may be an over-simplification. The Secretary feels that much of the

volcanic evidence on the plateau—for example, that near Lake Wonchi (south of Ambo), and those cones and lava fields now described—are not easily included in Blanford's classification. Accurate mapping and dating remains to be done, but it may well prove that volcanic activity has continued on and off in Ethiopia since Tertiary times until the present day.

A 30 km road, through the airport, along a very good road, takes one almost to the Tisisat Falls. A small detour is necessary as one of the bridges is not yet quite complete. Until this is finished, 4-wheel drive is advisable. The good road is to end at the dam site. From there a walk of 400 metres (probably only possible in the dry season, since one crosses part of the Nile on stones) takes one to the falls which are invisible from the road, except for the smoky spray. It is often said that the falls are best seen at dawn, but this is not exactly true. It is some time after dawn that the sun first strikes the falling water, and the traveller need not set off from Bahr Dar before the sun rises.

Bahr Dar to Addis Zemen (86 km): the bridges, though under construction, were not completed on this road, and 4-wheel drive is necessary. A firm of Israeli contractors is working on this stretch and they have their own private petrol pump (Shell) at the Addis Zemen camp. Their work may well be completed before the end of 1961.

From Addis Zemen to Gondar (95 kms) the road is in fair condition, though the bridges are not all complete and high clearance is needed to cross some of the streams. Four-wheel drive is necessary in wet weather and, the Secretary feels, to cross the streams also, though Mr. Dean has reached Addis Zemen from Gondar in a Volkswagen. This road passes through the mountain scenery of Begemdir. Again spectacular volcanic necks — baked pipes of old volcanoes — are passed and occasionally glimpses of the waters of the lake are obtained. Lake Tana was once considerably larger; indeed, the road from Bahr Dar to Addis Zemen often crosses fairly flat dry tracts of lake bed. However, it is from the mountains that these former beds are seen best for what they are.

Beyond Gondar, the road north to Aksum through the marvellous scenery of the Simien is excellent.

DR. AND MRS. PANKHURST AND MR. AND MRS. LOVELACE'S VISIT TO ANKOBER, TAKING THE TRACK FROM DEBRE BERHAN

Ankober was once the capital of Shoa. The name means the Gate of Anko, who was a queen of the Galla people who inhabited this area at the time of the invasions of Mohamed Gran until its reconquest by the king of Shoa.

The travellers were very well received by the Governor who told them they were the first outsiders to visit this historic spot for a year. The remains of a palace once occupied by Menelik still exist at Ankober.

NATURAL BRIDGES IN ETHIOPIA

Natural bridges in limestone, sandstone and basalt are common in the world. There is, for example, in Southern Tanganyika a great basalt bridge rivalling some of the more normal text-book illustrations, such as, for instance, the Rainbow Bridge in Utah, U.S.A. The Tanganyikan bridge is on the river Kiwara and is known as Diraja Ya Mungu, or simply "The Bridge of God."

These three rock types are common in Ethiopia and Ethiopia is not devoid of such bridges. Few people know that directly underneath the Highways bridge on the main road at Ambo just before the hot springs swimming pool, there is a natural bridge of basalt, under which the river flows. It was probably formed by potholing on the upper part of a waterfall cutting through and diverting the water. This is possible, since waterfalls in basalt and indeed in regions of other rocks, frequently undercut the cliffs over which the water flows, as they do the river banks. A pot-hole near the rim of a waterfall, cutting directly down, might reach the cave cut out by the splashing water.

The Italian maps of the inaccessible Webi Shebelli region mark a large natural bridge over the main stream. Little is known of this bridge, but recent Government plans for the exploration of the Webi Shebelli river basin prior to its development encourage one to think that we shall soon know more.

NOTES ON THE GEOGRAPHY SOCIETY FORMED IN HARAR BY DR. HERING OF THE TEACHER TRAINING SCHOOL

Dr. Hering, who was in Addis Ababa for a short time teaching at both the General Wingate School and at University College, is now in Harar at the Teacher Training School in charge of Geography. It was not long before he had organised an expedition to Mt. Condudo, a formidable mass, somewhat to the Eastward of Harar, one of the few places where the basalt cap still remains on top of the Mesozoic sedimentaries.

Dr. Hering was instrumental in starting a Geography Society in the T.T.S., and Mr. Greenfield, Head of the Geography Department of University College, was sent down to Harar by the University College to attend its first meeting and to give three evening lectures.

Since this time field excursions and talks have been arranged by Dr. Hering, with the encouragement of the Director, Ato Paulos Asrat. At the time of writing the chairman of the Geography Society, Mr. Last, is visiting Harar to give more talks on the Geography of Ethiopia.

The Geography Society of Addis Ababa wishes the geographers of Harar every success in this new venture. It is hoped that some interesting work on the Harar region will emerge. This region has always had a wide interest: in 1884 Major Harris, writing on the "independent principality of Harar, a spot yet unvisited by any

European", mentioned the town to be "situated in a pleasant well-watered valley surrounded by hills, and enjoying a cool and salubrious climate. The wall of mud and stone six miles in circumference with five fortified gates offers security for the population, whose houses, many of them two-storied, are constructed of stone, whitewashed and terraced. Mosques and minarets are conspicuous in every street."

Harar has now overspilled its ancient walls, but it is easily recognised from this description. The writer continues: "Around Harar the soil is rich and extensively cultivated, especially for coffee . . . scarcely a month elapses without the arrival of a trading caravan." Some work on the present crops and trading patterns in the Harar region would be most welcome.

Major Harris also stated that talla was "brewed and swallowed in alarming quantities" and "brawls and scuffles too frequently terminated the debauch in blood". Doubtless this no longer is the case!

A paper on the geology of the Dire Dawa district is shortly to be published in Israel. It is hoped to get further details later.

EARLY MAN IN ETHIOPIA

The interest of the members of the Geography Society has been drawn to the probable existence of early man in Ethiopia. It now appears extremely likely that the history of man began in Africa, and when one reads of excavations, such as those at the Olduwai Gorge at the east of the Serengetti Plains in Tanganyika, one wonders whether similar beds exist in the lake bed deposits of Ethiopia. Who knows what might be found?

Attention to the existence of evidence of early man was drawn by Mr. W. T. Blanford, in his classic "Observations on the Geology and Zoology of Abyssinia", published in 1870. He states:

> "In many places small chips of Obsidian are found scattered about, frequently far from any locality where the rock is met with in situ. From their peculiar form and the nature of the facets there can be little or no hesitation in attributing these to human manufacture. They are evidently the chips struck off in the process of manufacturing stone instruments

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Photo : Richard Greenfield

TISSISAT FALLS

The Tissisat Falls occur shortly after the Blue Nile leaves Lake Tana. Here the river plunges over a great lava flow and enters the gorge which is subsequently to become so spectacular a feature. The part of the falls seen above were photographed when the first light of the sun strikes them.

Some Notes on the Climb of Ras Dashan

by A. E. LOVELACE, *January, 1961*

Addi Arkai seems to be the most suitable place from which to ascend Ras Dashan, but the local people say that is in fact Debarick. It is almost essential to have identity cards and movement passes. When all the formalities are dealt with the people are most helpful. Debarick is a big village ; the people are pleasant and obliging. It is easy to get stores for the climb such as bread, tinned food, drinks and even paraffin (for the stove). It is possible also to use the school as a base. Clean pump water is available there and shelter and protection from the children. Stores should NOT be purchased Addi Arkai where they are more expensive and the people are less obliging.

The total distance from Debarick to the summit of the mountain is about 100 km. We did it all on foot but much of the journey is very monotonous and it would be best to have a mule or horse and to save one's energy for the actual climb. There is no place where one can comfortably stay on the way, and drinking water is not easily available, so that everything needed should be carried. The people are not very hospitable, but willing to bargain : in the last stages we found bottles more useful than money when bargaining for eggs.

Ras Dashan can NOT be seen from the main road ; the high mountain that can be seen from Addi Arkai and elsewhere is Bahit, itself well over 14,000 ft. The Bait range has to be crossed before Ras Dashan can be seen.

There is no difficulty in hiring horses; for some reason it was not possible to obtain mules. The servants of the horse owners who accompanied us knew the way. The policemen who were sent to "protect" us also knew the way. and were very helpful in leading the horses, packing and unpacking, and telling us about the people. We had two servants, two policemen and two horses used only for goods. If we were to do the trip again we would have more horses to be able to ride. For the horses we paid 20 dollars, for the men 12. We gave the policemen 6 dollars for tips but it was supposedly part of their duties to accompany us. It seems to me that mules are not necessary as the only part of the trip that caused the horses any difficulty was the region within a mile or so of the summit of the Bait range. The last stage of Ras Dashan, of course, must be done on foot.

The first section of the climb consists of low well-watered hills covered with coarse grass. Near the water the scene is pleasant because of big trees and varied vegetation. In a few places the slopes are steep earth strewn with rocks. The vegetation there is thin acacia forest and a few giant thistles. Crossing these rather monontonous hills one does not gain any height. We crossed interminable trains of donkeys taking skin bags full of grain to Debarick. Some of the biggest were protected by a man with a gun. A few miles out the scenery is pleasant in parts as the landscape is dotted with flowering bushes. There are however huge areas of intensive cultivation done with digging sticks instead of ploughs; the land is drab, windswept and cold. One wonders where all the labour comes from, for the villages are few and mean and there is little water. The crops are mostly cereals, including a lot of rye.

The second day we rounded a huge and splendid gorge, thus avoiding at least one very long up and down. On one slope there was intensive cultivation ; the other was almost covered with scrub. All day we met no water though we passed some dry river—or rather, stream-beds. At the foot of Bait, however, is a really fine rivulet and plenty of shelter and wood. This would be an ideal camping site. For a mile or two, roughly following the rivulet, there are irregular rows of giant lobelias. We called this singularly beautiful valley and the gentle slope at the foot of Bait " The Valley of Lobelias."

As we climbed the track became much rougher and

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and are frequently identical in shape with similar chips found in Europe and India."

It is now possible to state definitely that new Stone Age Man lived in numerous settlements around the beautiful crater lakes of Bishoftu (Debre Zeit). Much work on these sites has been done by Mr. Webb of the Imperial Air Force Technical School, but unfortunately he left Ethiopia before being able to complete his survey.

The Secretary and Dr. Mohr took specimens of Bishoftu artifacts and pottery to the Croydon Museum in Nairobi last year and Dr. Leakey identified them as Wilton "A". He predicted the discovery of other scrapers and microliths, which have since been discovered. Evidence of people of Wilton "A" age and culture have been found throughout eastern Africa. The type site is actually a farm in Cape Province, South Africa. There are many caves in Ethiopia where sample digs might be revealing, and microliths have been found by Society members in the lakes region, the Koka Dam vicinity, and on the flanks of Wachacha—quite clearly an early settlement.

Much work in Ethiopia has been done on the later archaeology, particularly that of Axum. One day a Stone Age archaeologist will find this country a rewarding field.

also strewn with rocks ; the lobelias ceased. Finally there was bare rock and the rather splendid gap through the mountain range, for Bait is a range, not just a peak or two. The gap is well above 14,000 feet. The descent on the other side is particularly steep to start with—in places one just goes from ledge to ledge. At times the loaded horses seemed to be standing on their front legs. Then the ground gradually levels out with sparse, untidy villages of circular and oblong stone huts. Far ahead we could see the grey mountain chain and a few spots of snow or ice, the first we had seen in Ethiopia. We had little choice but to camp near a village where there was no water except a filthy stagnant pool in a deep, dried-up river-bed.

The third day we began the attack on the mountain proper. Frankly, we could not tell which was the real summit by ordinary observation. Before us was a huge grey range with here and there a rounded hump and a cliff face facing us. We left a policeman to guard our base camp and took one horse, one policeman and the chief servant. Here we made a real mistake : we were not able to camp on the way, and so had to make the climb and come back all in one day. We followed a long, winding valley for some miles after crossing a beautiful, clean river. Fortunately there were mountain streams. We were now facing a sort of double hump that could be the summit ; the ice was now clear and white against the grey rock. We left the valley and started a climb over stones and rough earth. The region is surprisingly populated : there are small and large fields of cereals, some on fairly steep slopes, small villages of rough stone, brushwood and mud, large herds of cows, goats and sheep. Finally a few moderately steep hillocks covered only with grey-green grass. Below these a shallow valley watered by a little stream and then the grey rocks with some lobelias in crevasses and other surprisingly rich looking vegetation. Here and there was gleaming ice in patches. A serious attempt at Ras Dashan needs a camp in this region. At last we had passed all areas of settlement.

It was the afternoon and here our party became disorganized. We stuffed our pockets with biscuits, food and dried fruit. It was fortunately not necessary to carry water for there was plenty of ice to suck. Surprisingly it was not cold ; nothing like Kilimanjaro. I attacked the nearest peak of the double hump rather directly following a little stream-bed that seemed to point to the top. The first few hundred yards were not bad; little ledges, plenty of rich grass, grey stones, a rather tiring scramble over rocks, often on all fours. There were large blocks of rock that could not be scaled without equipment, so I had to find a way round them. Then I was apparently completely cut off from the summit by a cliff, but I found a chasm through it, and somehow climbed a frozen cascade holding on to the pieces of black rock jutting through it. I saw no animal on these last stretches, but did see some dung. More scrambling over and around rocks ; patches of ice, frozen pools, frozen cascades and dripping icicles. But the vegetation did not quite disappear except very near the top. Finally I was faced with a vertical cliff two or three hundred feet high. For me it was the end. Perhaps I could have found a way round ; a friend tells me that the other side was certainly a gentle slope. The altimeter showed just 15,000 feet. It would certainly be quite dark by the time I got back to camp. I just had not the courage to look for a way round. If we had had a base camp a mile or two away we could have tackled it with more courage the next day. I felt sure that the others had abandoned the attempt and were well on their way back.

I lost my way back and finally found refuge in a small and poor village. They could not give me a bed, but I buried myself in a straw stack and slept surprisingly well. I had great difficulty in persuading the people to bring me water. In the end they brought me a horn mug full of not very attractive water which I drank in a few seconds. I also gave them five cents for two eggs; they obviously expected me to eat them raw and were astonished when I demanded a piece of iron and showed them how to scramble them with a little oil over a smouldering, burnt-out stack. They had no eating tools, so I used a piece of cardboard broken off the altimeter box !

At the main camp we were able to have at last a good meal, and we washed our feet in a stagnant pool. On our way back we camped in the valley of Lobelias, a marvellous place, though rather cold at night.

Our big mistakes were : not allowing enough time, not planning carefully enough, not taking more horses. I am in the main a photographer, and I found perhaps rather less to see than the geographer might find on Ras Dashan. From my point of view I preferred the wild splendour of Kilimanjaro.

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The Peoples of Ethiopia

by GEORGE CLOVIS SAVARD

The purpose of this article is two-fold. First, to schematize our present knowledge of the prehistory of Ethiopia.[1] That is admittedly only a tentative effort because even though Ethiopia can boast to be the only country in East Africa with a " history ", its prehistory is still very little known. Much of our knowledge of the Upper Paleolithic, the Mesolithic and the Neolithic in Ethiopia is derived from the study of the sites and movements of prehistoric populations in the territories adjacent to Ethiopia. Often we can only surmise by inference what may have happened and—occasionally—must have happened in Ethiopia. It should be clear then that many of the statements that follow must be checked by archeologists, linguists and ethnologists who will have the privilege to work in Ethiopia. At the present moment, a tentative synthesis is valuable only if it helps research to orient itself better.[2] In the second part of this article an attempt will be made to describe briefly some of the most significant cultural traits that can be observed in various ethnic groups of today.

I. — TIME PERSPECTIVES

In 1928, Teilhard de Chardin discovered Porcupine Cave, a few miles south of Diredawa. Four years later the cave, excavated by P. Wernert, was yielding the only well-identified prehistoric human remains found in Ethiopia. They consist of the right part of a mandible with molars and premolars. No one, it seems, doubts that this is a human jaw although it shows " archaic " traits: massive bones, absence of chin, very large teeth, etc.

What did the possessor of the jaw look like? Perhaps like the Neanderthals, but more probably like the ancestors of the modern Hottentots. He lived some time betwen 10,000 and 15,000 years ago. Yet he did not belong to the first population that settled in the Horn. Stone tools discovered by Desmond Clark and Italian archeologists reveal that this part of Africa had already been inhabited for thousands of years by peoples whose cultures have been labelled *Upper Acheulian,* the earliest culture now *in situ* and found in numerous parts of Ethiopia, *Levalloisian* for the last pluvial (Gamblian) 70,000 to 10,000 years ago, and *Stillbay* for the dry post-pluvial period.

The makers of these tools were not much different perhaps from the proto-Bushman found in Singa (Sudan), or from the proto-Australoid from Eyasi (Tanganyika). They were not Negroid, however, because the Negroes came to East Africa much later, e.g., after the beginning of the Neolithic, in Kenya). The most plausible hypothesis is that they were Bushmen.

During the 5th millenium B.C., agriculture was developing rapidly in West Sudan. It may have been stimulated by Egypt, but Murdock's analysis of botanical, ethnographic and linguistic data seems to indicate an indpendent innovation and thus we could add the invention of agriculture to the credit of one of the " purest " negro populations in Africa.

The 4th millenium B.C., very likely, saw the propagation of agriculture eastward and, in the area that concerns us, the last phases of the Hargeisan culture (in existence perhaps since the beginning of the Gamblian). The Hargeisan is a stone culture characterised by blades and similar to the Capsian cultures of Kenya and Tunisia (perhaps just a phenomenon of parallel evolution). The Hargeisan industry is clearly distinct from the industries of the " Bushmen " and, according to Bailloud, must be attributed to a different stock, a population of " Homo Sapiens ". Murdock, trying to be more explicit, describes them as Caucasoids and proto-Cushites.

In the course of time, the Wiltonian industry superseded the Hargeisan and eventually became dominant in the totality of South and East Africa. Characterized by Microlithic tools: lunates and thumb-nail scrapers, made of obsidian, it is found in numerous sites, from Harar to Sidamo, and from Yavello, through Moggio, Debre Zeit to the Dahlak Archipelago. This industry lasted till comparatively recent times; in fact during historical times, in Djebel Djinn (Côte Française des Somalis).

The Doian industry finally appeared in the South and Centre of the Somali Plateau. A very late derivative of the Magosian, it reveals the importance of hunting, the beginnings of animal domestication and, perhaps, incipient agriculture in the site of Mersale Wells.

In Ethiopia, it is very difficult to utilize stone industries in order to determine the beginning of the Neolithic period (village farming communities). Ground stones are extremely rare, except in the southwest where Azais discovered abundant artifacts establishing the existence of Neolithic agriculturists who spread, he thought, from the Beni Shangul territory to Lake Rudolf. Decorated ceramics and even some metal implements were found in association with the stone tools. Thus the gap would be bridged between the Neolithic of the Sudan and that of Kenya.

Murdock believes that this agricultural " revolution " occurred circa 3000 B.C.: Negroes broke through the western frontier, settled in Wallega and then brought agriculture to the Plateau. The Agau, thereafter, demonstrated a remarkable spirit of inventiveness, even if they owed agriculture to the invaders. They discovered new varieties of the cultivated plants introduced by the Negroes, e.g., *durra*, but they also enobled some of the plants that grew wild, and originated a cultivation that has lasted till our day: finger millet (*dagussa*), *teff*, *enset*, cress, safflower, coffee, *kat*, kastor, etc. It appears also that the Agau domesticated the donkey and discovered how to breed mules.

About 2250 B.C. the pastoralists Beja, or their ancestors, gained much territory in Southern Sudan and acquired lands that had belonged to flourishing Negro farming communities for over 1,500 years. On the Red Sea, for centuries already, the Egyptians had been sending expeditions to the land of Punt (today the " Côte Française des Somalis "), while on the highlands, the Cushites of Ethiopia had begun a diversification which separated them into three great groups: the Central Agau, the Western and the Eastern Cushites.

Towards the end of the 2nd millenium, we can assume that the southern Cushitic population started fanning out in a great expansion movement that stopped only on the parallel of six degrees South latitude. In fact, East African archaeology reveals the presence (1000 B.C.) of a very restricted group of peoples who knew agriculture very well and who settled on the highlands (perhaps because they enjoyed a heavier rainfall) of Uganda, Kenya and Northern Tanganyika. The population living today on, or about, these sites have been called " Hamitized Negroes " and " Nilo-Hamites ", and there is some evidence (although some linguists disagree) suggesting that these populations once spoke a Cushitic language. But more significant perhaps is the fact that contemporary highland peoples (e.g., the Nandi, Meru, Hill Suk, Chagga) who occupy sites that were perhaps settled by prehistoric southern Cushites also share a certain number of traits that seem to predominate among the Cushitic populations of Ethiopia. An exhaustive inventory of traits should be taken, even at the risk of ruining this demonstration.

At the beginning of the 1st millenium B.C., the Sabeans came across the Red Sea to Ethiopia. They brought with them the arts and skills of a civilization which could boast remarkable achievements, especially perhaps in agriculture and trade. It was not long before they sailed south and reached the Horn. Murdock[3] speaks of " historical sources " saying that Himyaritic Arabs of South Arabia controlled the coastal towns of what is now the *Côte Français des Somalis* and British Somaliland for perhaps 10 centuries B.C. Later (about 60 A.D.) we learn from the *Periplus of the Erythraean Sea* that the Yemeni merchants then on the coast of " Somalia " and " Kenya " were married to local women and understood the native language. But was the native population Cushitic? Archaeology points to the affirmative because traces of Negroid occupation are absent for many centuries. Other facts also seem to confirm this view: in particular the presence of phallic stones, along the coast, like those found in great numbers in Southern Ethiopia (there is even one on the Entoto, in Addis Ababa).

Perhaps during the second half of the 1st millenium B.C., Yemeni immigrant (?) converted to pre-Talmud Judaism a group of northern Cushites whose descendants we know as the Felasha. The same period of time must have witnessed the rapid rise of Axum, seemingly with very little interference, or help, from Egypt, Rome or Greece. It was an original evolution and a fairly swift one, since in the 4th and 6th centuries A.D. the Axumites were able to return across the Red Sea to go and fight with their allies.

In the first centuries after Christ, the Yemeni began to dominate the African coast of the Indian Ocean as far south as Kilwa. They lasted until the time almost of the Portuguese, except for some 300 years (575-879 A.D.) when the " Persians " took over control and extended the trade of Arabia-Africa as far as China.

At the beginning of the second half of the 1st millenium A.D. a great migration began to take shape. The Bantu started their sensational trek to the East and, after crossing the forests of the pygmies, they encircled Lake Victoria and ultimately reached the coast, probably during the period when the Persians were in control of the trade. Azania, the coast of southern Somalia, Kenya and Tanganyika, was then in full prosperity and, very likely, it was the Azanians, eager to exploit the rich mines of the interior, who caused the building of the complex structures of Zimbabwe and Mapungubwe (carbon date: beginning of 7th C.A.D.). Already gold and slaves were pouring in quantity out of East Africa.

Meanwhile, a population from the Nile, perhaps after having learned the art of dairying (from the Beja?) began expanding with explosive force. These Nilotes moved south, were deflected to the east by the better organized Bantu kingdoms of Uganda, and finally reached the Rift Valley in Kenya and Tanganyika. Little by little, the highland farmers who had been there for some 2,000 years found themselves surrounded by Bantu and Nilotic populations. The process of assimilation began to take place and the Cushitic peoples lost their identity more and more. Today, we can identify only a few Cushitic speaking groups, all of them separated by a distance of at least 400 miles from their Cushitic " brothers " of Ethiopia. We can name the *Burungi*, the *Goroa*, the *Iracq* and the *Mbugu*.

At approximately the same time, a similar population explosion was probably taking place in the upper regions of the Somali Plateau. Agriculturists belonging to the stock that gave rise to the Agau, but unchanged yet by Christianity or Semitic influence, were learning (?) in their turn the techniques of pastoral life that had trickled from the north (?) or the west (?). One group rapidly branched off and started to move northward and settled in what is now the arid Afar (Dankali) desert. At the same time (or perhaps before) another group started moving east and south. These were the ancestors of the modern Galla (Oromo) and—it seems—they liberally dotted a considerable part of the Horn with their sites. Finally, a third group, one with seemingly greater cultural maturity, began with the help of herds of animals to spread over the lowlands. Soon, enough of these ancestors of our contemporary Somali discovered that many peoples had preceded them into the Horn: The Galla and the Bantu, who had already intermarried very much, and the first occupants of all, the Bushmen.[4] Above all, there were always imigrants coming from Arabia or Yemen. Some of them, with the prestige given by a superior knowledge of Islam, became the ancestors (or were adopted as ancestors) of lineages that have become very numerous today.

Hundreds of years later, probably in the 13th century A.D., the Galla began to feel the pressure of the Somali expansion on the coast. And, at about the same time, with the re-establishment of the Solomonian dynasty, Abyssinian influence reached the south and south-west. But because of the presence of Islamic powers also competing for these areas, this influence was felt only sporadically. It is possible that lexico-statistics will, some day, trace to this period the beginning of the Gurage languages from their Sidamo, Amharic and Harari substrata.[5]

In the 14th century the Somali occupied the coast of Somalia as far as the lower Sibeli, and in the 15th century they held the whole valley of the sibeli for themselves. Pushed out of the Somali territory, the Galla[6] tried, soon after the defeat of Ahmed Grañ, to infiltrate into Abyssinia from the South. But the Abyssinians, exhausted by war, let the Galla add conquest to conquest during a good 50 years. Some Sidamo states were conquered and became Galla states in the course of time, but other kingdoms proved so strong as to preserve their existence. (In fact, the Galla never acquired any land south of the Godjeb.) In the 20th century, it was left to Menelik to recover lands that had been long forsaken and to give Ethiopia its modern look.

MODERN ETHIOPIA IN THE MAKING

The population of Ethiopia, like that of every old nation, is a miniature world in itself with, certainly, a very remarkable wealth of cultures, or sub-cultures, all different enough from the rest of African cultures to constitute an original unit in themselves. But a unit with many faces, a unit so complex that any attempt at schematizing the facts or streamlining the conclusions can be a distortion of reality; should we stress, for instance, unity or plurality?

The tendency nowadays is to emphasize unity, to speak of Ethiopians instead of Oromo, Amhara or Gurage. This is a healthy orientation and a well-timed shift of emphasis. At the moment when there is so much talk about Pan-Africanism, one would have to be the worst type of " reactionary " to insist on differences between Tigri, Gojjamites and Gondari. Nevertheless, if we want to speak of a population as rich in human cultures as that of Ethiopia, we must use a certain amount of classificatory devices.

One working distinction could be made between urban and rural segments of the population. In Addis Ababa, for example, ethnic or tribal affiliations matter little (how little, especially when it comes to marriages, I will let the reader decide), and certainly the Senate, the executive branches of the Government, the Ecclesiastical Hierarchy, the Army and even the U.C.A.A. Student Council are generally established on principles different from those of ethnic origins.

But when we come to rural populations, the degree to which ethnic affiliations have vanished varies. The feeling of being an Ethiopian first can be very great in some groups, and it could be increased in others. But there is nothing strange in that state of affairs. That should even appear normal to us when we reflect on the complex historical background of Ethiopia and we should perhaps rather marvel at the rapidity with which national consciousness is developing in Ethiopia, integrating at higher and higher levels age-old particularisms that once kept people wide apart. A whole study could be made only on the institutions that have favoured, and hindered, this growth of the Ethiopian nation.

Now if I single out some ethnic groups in Ethiopia, it will not be to stress their differences as much as to show some aspects of their contribution to the quality of the Ethiopian society as a whole. I am interested in unity, but I am also interested in variety, in as much as it is a fact, and a reality. I am interested in what we could call the various types of cultures in Ethiopia simply because they exist. I do not particularly hope to preserve any specific tradition—that is not my business —but I want to understand what Ethiopia is made of and what will likely be the substance of tomorrow's society. Many things will disappear, more or less rapidly, some of which were probably very valuable when they were incorporated in a body of tradition; others will be preserved. On the other hand, the population of Ethiopia will not be made up only of urbanized citizens, far less of " been to's " who sometimes have dissociated themselves from their own ethnic groups. It will be composed, largely, of the descendants of the rural people of today and it seems worthwhile to consider what sort of enrichment these will bring to the population of Ethiopia as a whole. Let us then single out some areas of Ethiopian culture in which we find sections of our population ready to make various contributions, or forced to face specific problems, in the process of modernization. I shall limit myself mostly to ethnic groups that are less known, some of them also less developed than others, but all of them capable of participating fully in the life of modern Ethiopia.

Although the Amhara and Tigri are among the best

known sections of the population, some aspects of their contribution to the building of modern Ethiopia are perhaps not too obvious. The Amhara and Tigri have been the official agents of directed change, and have shown a certain intellectuality indispensable in a progressive population and partly reflected by the Amharic script. The Amhara, moreover, have been outstanding by giving their women a status of legal, and social freedom far superior to that of any neighbouring country; but their greatest contribution certainly consisted in the elaboration of a complete State structure while keeping it, at least theoretically, separated from the Church. No matter how powerful the Emperor, he could never claim to be above the law of God represented by the hierarchy of the Christian Church. And this influence of the Church, always very great, has not prevented the integration of a large Moslem part of the population into the Ethiopian nation. That could not be done rapidly of course, but when the Ethiopian Government had mosques built in Moslem areas and when Moslem leaders were invited to sit with Christian leaders at official ceremonies, it was revealed clearly how far Ethiopia had gone on the path to nationhood.

Let us raise now a difficult question in relation to politics and ask what contributions we can expect of diverse Ethiopian groups in terms of the development of the democratic ideals heralded in the new Constitution of Ethiopia. This is a very complex problem of course, and only general suggestions can be given here. If, for example, we take the Somali *shir*, which is a council made up of the elders of a small kin group, we discover that it is a body open to all adult males of the group and, certainly, is an institution which develops in its members a sense of service to the community. Shifting to higher level in the Somali tribal system, we discover that the tribal chief himself has to be elected by the Council of Elders of the tribe. This institution again could be utilized as a strong basis for democratic development.

The Gurage used to have a General Assembly that was, also, very democratic in the best sense of the word. It was the highest political body and yet was run only by a chairman elected and controlled by the elders. So again, we find the idea of social responsibility shared by all members of a society.

The Galla, also, had a system admirably suited to train people for active participation in the government. The potential rulers were normally trained for leadership during a period which lasted about eight years, by observation and imitation of the actual ruling group. Only after this period of apprenticeship could they take over the responsibility of rulers and act as judges or legislators. This, however, would only last for a definite period of time, after which they were mercilessly dismissed and replaced by a fresh group of rulers.

But there are other aspects of Ethiopian life that will accrue to the Ethiopian character of tomorrow. Many groups, especially the Sidamo and the peoples of the Horn, have a very egalitarian social system. In the desert the school director and the school zabanya can sit and eat at the same table without creating a sensation. But it was a very different story in the old Kaffa society in which were found very definite class and caste distinctions. The Kaffa population was divided into four Kaffa sub-tribes, two groups of foreigners (the Moslem traders and Christian Amaro), and three submerged classes (the Manjo hunters, the Manno leather-workers, and the Qemmo blacksmiths). More complex still was the stratification of Janjero, a stratification reflected in the most amazing linguistic fashion. The Janjero language had, so to speak, three garbs. Besides the common language spoken by ordinary people, there were two others; one the language of respect, to describe the ordinary actions of the nobles, and the other, the royal language, used to describe anything with reference to the King. To eat, for example, would be *ma* in common language, *ta* in the language of respect, and *bos* in the royal language. The Janjero, of course, were an extreme case, as are also the desert peoples and the ideal situaton, it is easy to surmise, surely stands half way between the two.

Let me explain briefly now a type of social organization that we observe among hundreds of thousands of Ethiopians and which bears great potential for helping a situation, it is easy to surmise, surely stands half way to build a strong Ethiopian State. This is the segmentary type of society that we observe among lowland populations, like the Afar, the Somali, the Anuak and possibly some others. It is an organization based on kinship relationships, especially on descent in the male line.

That system presents obvious advantages for a population nomadizing on large territories. It affords a sharing of authority and provides cohesion for the otherwise isolated sections. Even when in movement, these patterns of relationships are preserved. For example, the families in group 1 will graze their animals together, as will the families from group 2, and both groups will keep near each other and not wander beyond the limits of the territory of Group A. Similarly their " brothers " from Group B will divide an adjacent area among themselves and pastures of Group A and of Group B, plus those of Groups C and D will constitute the tribal territory.

It is not easy, of course, to establish a supra-tribal organization when the tribal system functions so coherently. There are chances that the patterns of opposition of the segmentary society continue to function and then undermine the new political organization. This step to the supra-tribal organization can be taken however, and I think that the existence of a few Sultanates in the desert points to the possibility of a shift of emphasis from a segmentary to a central organization. It is interesting, in that respect, to see how the native hierarchy of the Ganda has been modernized. Now, the hierarchy with power running up to the top is aligned in the following manner: it starts from the village, then moves up to the parish, the sub-county, the county and the district. It seems that in a centralized system, the response to representative government would be slower than in a segmentary population.

Very interesting also in terms of contribution to the future patrimony of Ethiopia are the societies of

situation, it is easy to surmise, surely stands half way mutual help described by Dr. R. K. P. Pankhurst, and Endreas Eshete in the "Ethiopia Observer",[7] and by Temesgien Gobena and Asfaw Damte in the 7th and 8th issues of the "Ethnological Society Bulletin".[8] *Ekub, Idir, Dabo, Jige* and other forms of friendship societies are well known and I do not think I have to dwell on them. Let me just mention, however, an archaic group of the southwest, the *Ari,* who have an original form of co-operative system. There, the young men join to form labour organizations. They will work in co-operation and go from place to place offering their services in times when the demand for labour is greater.

These young workers constitute some kind of age-group reminiscent of a system almost extinct today but one that once formed the backbone of Oromo society. It is the *Gada.* The *Gada* used to divide the whole Oromo population into five groups, let us call them A, B, C, D, E. If you were in group B, you would normally remain in it for the rest of your participation in the *Gada* and you would move with all your fellows from Group B (whether they be in Addis Ababa or any other part of Ethiopia), through five grades lasting eight years each. Let us suppose that you join the *Gada* cycle in 1960 as a member of Group A. Eight years later you would become a learning warrior, then in 1976 a warrior in service. After eight more years you would be a learning elder, i.e. from 1984 to 1992, and then from 1992 to the second millenium you would belong to the grade of the rulers. The marvellous thing about the *Gada* is that it used to cut across every possible category in the Oromo society and unite together people who could have been separated by geography, religion, political or tribal affiliations. An Oromo, for instance, in the second grade was very intimately related to any other Oromo of the same grade in the whole of Ethiopia. There were characteristics of the *Gada* system that would, of course, never fit into modern Ethiopia, but one wonders whether some aspects of it could not be salvaged for the benefit of the new Ethiopia, where such a solidarity is going to have a survival value.

Now let us touch on another vital point. A cultural trait is usually important only in relation to its cultural context. For instance, it is only because the people were Oromo that they pointed with their third finger. But some cultural traits may correspond to some fundamental needs in the development of civilisation, and for that reason assume an almost absolute character of necessity. I think that the capacity of the Gurage for manual work is one such case. The only people who would perhaps like to contest this point are the Gurage themselves because they are not so sure that love for manual work is really a Gurage trait. Among the Gurage there are three submerged castes, or segments of the population who are kept apart, may only marry among themselves, and even if they are called upon to perform important ritual functions, e.g. at birth or at death, are nevertheless looked down upon because of the kind of work they are doing. These three Gurage castes are, from the bottom up, the *Fuga* who make wooden chairs, tables of bamboo, doors, etc. (*Fuga* women make pots); second, the *Buda,* who are leatherworkers, and third the *Nafere,* poor blacksmiths who, however, enjoy a little and rather ironical compensation: their women are most beautiful even though taboo for all the other Gurage.

Some other traits are so deeply rooted in a culture that they change very slowly. The Customary Law is one such area of conflict where the forces of tradition and those of innovation can battle for a long while. There are innumerable points of readjustment between traditional laws and the new civil and criminal codes, and some of the most difficult problems will doubtless arise about land ownership. One can imagine what different riddles the legislator faces when one thinks that in Tigre there are lands still owned in common by many people, in Kaffa there were no private ownings, the land being the exclusive property of the Kaffa kings, and in the deserts and semi-deserts the concept of property is often inalienably united to the idea of occupation; a piece of land that is not cultivated is yours to pasture your animals on whenever you wish, especially if you are strong. Evidently, it will not be easy for the new law to supersede the old one, but this will come about eventually, and it will ultimately become clear that the new state of things is as well adapted and efficient as the former one.

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[1] "Ethiopia" is used here to designate the territory comprised within the boundaries of contemporary Ethiopia and Eritrea. "Abyssinia" is reserved for the old kingdom of the Central Highlands.

[2] [3] George Murdoch's **Africa : Its People and their Cultural History** was largely relied upon in this first part.

[4] This process, that we could call the "pastoralization" of farmers, is still happening nowadays. The members of the Frobenius Institute who visited the southwest, less than 10 yeas ago, claim that the **Tsamako,** who live north of Lake Stefanie, are actually in the process of becoming cattle breeders and lowland people. In this way they are breaking a long tradition because they used to practice agriculture on the highlands, exactly what their neighbours have been doing, and are still doing to this day.

[5] It is more likely, however, that the origins of the Gurage and the Harari could be traced back to a minor invasion from south Arabia during the Axumite period, perhaps between the 5th and the 7th Centuries A.D.

[6] In the 19th Century they were pushed back further, to the River Tana, in Kenya.

[7] **Ethiopia Observer,** Vol. II, No. 211, December, 1958.

[8] University College of Addis Ababa: Ethnological Society Bulletin No. 7, December, 1957; Bulletin No. 8, July, 1958.

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The Power Resources of Ethiopia

by G. G. LAST

POWER RESOURCES IN AFRICA

We are living in an age of great activity and development on the continent of Africa. Not the least of these developments, as far as economic geography is concerned has been the creation of new and important sources of energy. Names like Kariba, Owen Falls, Volta River and Aswan, are probably the most widely known and discussed aspects of African economic development. Africa, up to the decade now beginning, has been noticeably deficient in developed sources of energy. Coal is present, but only in significant quantities in South Africa, and then the reserves of the Transvaal, Natal and the Orange Free State represent only $4\frac{1}{2}$ per cent. of total estimated world reserves. Oil is present in North Africa but including the newly discovered deposits in Algeria these represent only some five per cent. of the reserves available in the Middle East oil fields. The African continent now produces only a small fraction of one per cent. of total world production of crude petroleum and of this, Egypt alone produces over 90 per cent. As the invention of the wheel had not penetrated to most of the continent of Africa before the middle of the last century, widespread use of wind and direct water power was not possible. In common with other areas where the economy in general is poorly developed, Africa had not, until very recently, proceeded very far in the development of her hydro-electric power resources. The situation in 1948 was as follows:

Table 1: Development of hydro-electric power resources by continents

Continent	Developed H.E.P. as % of estimated potential
Africa	.1 per cent.
South America	3.6 per cent.
Asia	8.0 per cent.
North America	42.6 per cent.
Europe	51.4 per cent.

These figures are, of course, a reflection of many different factors in the economic and political scene. They are a reflection of the high capital cost of large hydro-electric power schemes, of the non-availability of investment capital for the development of such schemes, of the absence of an industrial and consumer demand for electricity, etc. It is, however, significant that, to a large extent, the awakening of interest in the economic development of Africa has taken the form of a provision of capital for the development of power schemes designed to break the vicious circle of under-development and to provide a basis for industrial development which will bring about a greater utilisation of African economic resources and a consequent higher standard of living.

AVAILABILITY OF SOURCES OF POWER IN ETHIOPIA

The situation in Ethiopia, from the point of view of the development of power resources, is in most respects similar to the rest of the continent. Africa is poor in all sources of energy except hydro-electric power. Her H.E.P. potential is enormous and represents some 40 per cent. of the total water power resources available on the globe, although the present installed capacity represents only about one per cent. of the potential, even allowing for recent developments. Ethiopia, too, has an enormous hydro-electric potential but the prospects of development of other forms of energy are poor.



Photo : Richard Greenfield

KOKA DAM IN THE COURSE OF CONSTRUCTION

In the immediate foreground are the flood gates where any excess water in the artificial Koka Lake can be led to pass into the Awash Gorge and on to where the river finally dries up. Water for power is taken from the further end of the dam, through a great pipe, which is now covered with earth as an insulator. The pipe then divides into three, providing the power for the turbines which supply the Addis Ababa and and Dire-Dawa power lines with electricity.

The use of direct water power is widespread on the highland areas of the country. These are the regions of ample rainfall where the streams have the longest period of flow during the year and where most of the grain crops are grown. Small mills driven by simple water wheels are therefore quite common, although the total contribution of such mills to the economy of the country has not been estimated, nor is it known for how long they have been a feature of the Ethiopian countryside. All but a few of these mills are very small scale and of local importance only. Near the larger centres, in particular near Addis Ababa, larger flour and oil seed mills, built during the last 50 years, and previously operated by water power, have now been converted to electrical power or have become derelict.

Deposits of coal have not been located in Ethiopia. There are, however, widespread but relatively small deposits of lignite. The most notable of these occur along the eastern fringes of the plateau between Waldia and Debra Berhan where faulting has exposed the sedimentaries underlying the basaltic cap of the plateau; on either side of the Didessa River valley in Wollega province and probably also in other valleys where the rivers have eroded down to the sedimentary rocks and finally in the region of Chelga to the west of Gondar in Begemder province. Most of these deposits have the disadvantage that the seams are thin, although several seams may be present. All the deposits require expenditure on mining equipment and facilities and the development of transport facilities before they can be used, and a careful estimation of the reserves available has to be made before such expenditure takes place.

The most general conclusion is that these lignite deposits may provide a useful local fuel substitute for wood and charcoal but they are not likely to make a significant contribution to industrial development.

Wood and charcoal are both used to a small extent at the moment in both private and municipal thermo-electric power plants, and some charcoal is used in thermo-electric stations to produce charcoal gas, which is used in the power plant. In view of the rapid destruction of wood and forest land in Ethiopia this must not, however, be regarded as a permanent or expandable feature of the power economy.

Prospecting for oil deposits has been in progress for some time in both the Ogaden province and Eritrea. Although the geological formations in these areas give promise of possible deposits, no large pool has yet been located and Ethiopia must at present import all her oil requirements. These, at the moment, take the form of refined oil products but plans have now been made to establish a new oil refinery at the port of Assab. This should come into operation in 1964 and will eliminate the need to import refined products, although it will depend upon imported crude oil, unless productive home sources are developed by that date.

Prior to the establishment of the hydro-electric power plant at the Koka Dam on the Awash river 64 per cent. of the electricity produced in Ethiopia was supplied by thermo-electric power plants. In the absence of local raw materials, most of these relied upon imported supplies of coal and fuel oil. In spite of the cost of imported fuels, there are several reasons why thermal electricity remained more important that hydro-electricity before the completion of the Koka Dam project. In general, thermo-electric stations are less expensive to construct and they can be more quickly constructed. They can be placed adjacent to the centre of consumption of the electricity which is to be produced and therefore the cost of transmission lines, which may arise in the case of a hydro-electric resource which is not conveniently located, can be eliminated.

The production of thermo-electricity is most developed in Eritrea and this region produces over 80 per cent. of the themo-electrical output of the Empire. This is largely because the H.E.P. potential in Eritrea is small. This is a region of scanty rainfall and few rivers, none of which have a permanent flow. It is also partly due to the fact that the cost of imported coal and oil is relatively low. The larger centres of population served by thermo-electricity are relatively near to the coast and the port of Massawa, and are connected by rail with the port. For this reason, the largest thermo-electric power station in Ethiopia is located in Massawa itself. In all, some 21 centres in Ethiopia have a thermo-electricity supply and the most important thermo-electrical power plants are located at Massawa, Asmara, Assab, Keren and Decamere in Eritrea, and at Addis Ababa (in reserve), Harrar, Dire Dawa and Gondar in Ethiopia proper.

The total production of electricity, prior to Koka, amounted to approximately 64 million kwh per year with an additional estimated 20 million kwh from private power plants. Hydro-electricity accounted for the remaining 36 per cent. of this output of 64 million kwh, and some eight centres were served by H.E.P. plants (Addis Ababa, Nazareth, Ambo (Hagere Hiwot), Wolisso (Genet), Dire Dawa, Jimma, Debra Berhan and Asmara). The hydro-electric plant at Aba Samuel, which supplied Addis Ababa, also supplied Akaki and Bishoftu (Debra Zeit) in the same region. This power plant was by far the largest in the Empire and produced over 80 per cent. of the total output of hydro-electric power. The other H.E.P. plants were comparatively small and supplied largely town services.

In 1955, however, there were still a number of the larger centres without electric power. These included Lakempti, Gore, Assella, Godole and Irgalem. Also, the electric supply was largely localised. There was no electric grid system and only a total of 135 kms of transmission lines of more than 10 kw. The major transmission systems were as follows:

1. Aba Samuel—Addis Ababa 32 km : 45 kv
2. Asmara—Massawa ... ... 75 km : 25 kv
3. Akaki—Bishoftu ... ... 25 km : 45 kv

POTENTIAL HYDRO-ELECTRIC POWER RESOURCES

The total amount of electricity produced (some 85 million kwh) represented only a very small fraction of the potential (perhaps .5 per cent.). Some idea of Ethiopia's comparative position can be obtained from the following figures which take production and area into consideration:

Table 2: Comparative production of electricity. Selected countries

Country	kwh per hectare per year
Ethiopia	386
Turkey	190
France	330
Sweden	6,750
Norway	3,230

(N.B. The figure of 386 for Ethiopia would rise to 606 if all the areas in Ethiopia (e.g. the desert and semi-desert regions east of the plateau) with no H.E.P. potential whatsoever are eliminated.)



H.I.M. Emperor Haile Sellassie and the Reparations Commissioner, Major Asefa Lemma, survey the installations at Koka.

Before the construction of the Koka H.E.P. station, the production of hydro electric power was approximately 26 million kwh per year, and some idea of the small fraction of the potential which this figure represents can be gained from the estimated figure of 1,355 million kwh per year for the Blue Nile basin **alone** which has been calculated by the Water Resources Department.

If we consider again the figure of 606 kwh per hectare per year (the pre-Koka average per hectare for areas where potential exists) it can be seen clearly that the Blue Nile Basin does in fact represent the most fruitful region for hydro electric power development. The three major river basins compare as follows:—

Table 3: Hydro-electric power potential. Major Ethiopian river basins

River basin	Undeveloped resources
Awash	80.5% of 606 kwh per hectare per year
Webi Shebelli	81.0% of 606 kwh per hectare per year
Abbai (Blue Nile)	223.5% of 606 kwh per hectare per year

The following table shows estimates prepared by the Ethiopian Electric Light and Power Authority for the major river basins in Ethiopia:—

Table 4: Detailed estimates of hydro-electric potential. Major river systems

Basin	(A) Total million kwh	(B) Utilisable million kwh	B as a % of A
Abbai	79,863.5	24,900.0	31.2
Webi-Shebelli	21,562.3	7,044.6	32.7
Omo	16,067.1	4,595.9	28.7
Tacazze-Setit	14,846.5	5.047.7	33.9
Awash	4,106.2	1,304.0	31.8
Baro	3,017.0	1,211.0	40.2
Juba	2,273.0	654.0	29.3
Mareb-Gash	1,745.6	569.2	32.6
Totals	143,480.2	45,326.4	

In addition, possibilities exist in the Barka, Angareb, Gira-Scinfa, Dinder, Ghelo and Akobo river basins, and in the Alomata region, which brings the total potential to 145,141.6 million kwh, and the total utilisable H.E.P. resources to 45,743.2 million kwh. These figures, prepared in 1955 by M. Kleindienst, now Chief Engineer of the Ethiopian Electric Light and Power Authority (see Bibliography, No. 2), may well represent a conservative estimate, and can possibly be revised in an upward direction in view of recent work in the Blue Nile drainage area by technicians of the Water Resources Department.

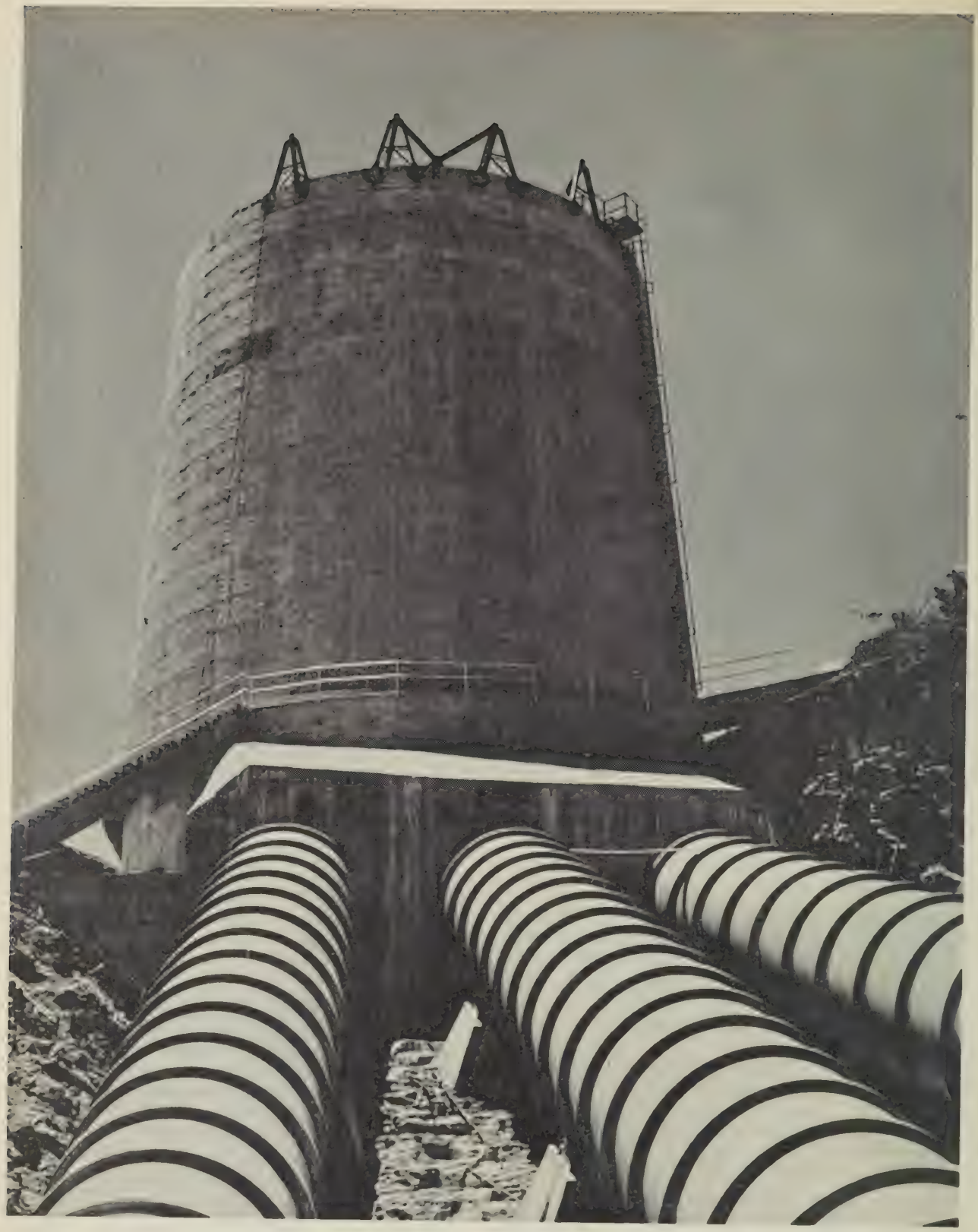


Photo: Haile Mezemghe

The Surge Tank at Koka dam.

RECENT DEVELOPMENTS

1. The Koka H.E.P. Scheme and the Awash River Basin

At the moment, the greatest actual demand for electric power exists in the region of Addis Ababa and south-east Shoa province, and in the Harar-Dire-Dawa region. The priority for development has naturally therefore been given to the Awash river basin, and the first of the projected plants is now in operation at Koka, some 80 km. to the S.S.E. of Addis Ababa. Koka also had the advantage that it had been the subject of previous Italian investigation as a power site, and work on a much smaller H.E.P. plant had been initiated during the Italian occupation of Ethiopia. Work was commenced at Koka in December, 1957, and capital for the project was obtained from the War Reparations Fund. The site is at the head of a gorge where the Awash river has broken through a ridge of basaltic material. The resultant gap is a natural dam site, and immediately downstream from this site is a fall of some 20 metres to the river bed. Upstream, the Awash flowed over a wide plain in the floor of the Rift Valley (an old lake bed prior to the break-through of the Awash river at Koka). The river has been dammed by a concrete wall 484 metres long with a maximum height of 47 metres. The reservoir, which will take some 2-3 years to reach its maximum capacity, will eventually reach some 26 kilometres upstream towards the lower slopes of Mt. Zuquala. It will have a total area of 255 sq. kilometres and will draw on a catchment area of approximately 11,000 sq. km., comprising largely the headstreams of the Awash river, which rise in the heavy rainfall areas of the plateau of southern Shoa province. The lake will provide a maximum head of water of 42 metres at the dam site. The power station, comprising 3 vertical Francis turbines of 18,000 h.p. each, and 3 vertical 18,000 KVA three phase generators, has an average capacity of 105 million kwh per year.

The initial supply of 53 million kwh in 1960 will rise gradually to 105 million kwh in 1963, when the reservoir will be at its maximum capacity.

The effects of this construction on the power economy of Ethiopia are important:

(1) The maximum output from Koka represents double the total pre-Koka production of electricity in Ethiopia, and five times the previous output of hydro-electricity. Hydro-electricity is now more important than thermal electricity.

(2) The demand for electricity from industrial and urban users in the Addis Ababa-Dire Dawa region will be satisfied for the next five-year period.

(3) A considerable reduction in the electricity tariff has been possible, and the benefits of cheap electricity from Koka have been spread over the whole country in a new electricity tariff initiated in June, 1960.

(4) The supply of electricity to points distant from Koka has necessitated the development of a transmission grid system at 132 kv. (Koka-Addis Ababa, 81 km. transmission line; Koka-Dire Dawa, 337 km. transmission line; with an additional 45 km. of 45 kv. from Dire Dawa to Harar).

(5) The side effects of the construction of the Koka Dam are important to the general agricultural economy. The Awash river, in common with all Ethiopian rivers, is subject to considerable seasonal variations in flow. (The former maximum flow observed at Koka, prior to the construction of the dam, was 650 cu. metres per second, and the minimum 4 cu. metres per second). It will be possible to maintain the flow in the future between the figures of 90 and 15 cu. metres per second, to the considerable benefit of agricultural development downstream from Koka. Here there are excellent possibilities for extending the present sugar plantations and for the cultivation of other tropical crops and fruits.

The Koka hydro-electric project is, in fact, seen as part of the general development of the middle course of the Awash river. It has been estimated that between Koka and Awash Station (approx. 150 kms. downstream) there are possibilities for the development of some 800 million kwh additional power and, again, downstream from Awash Station, a further 400 million kwh, making a total of 1,200 million kwh as yet untapped. In view of the fact that industrial development in this part of Ethiopia is proceeding apace, and that demand for electricity may well exceed supply in 1965, a certain priority has been given to the construction of H.E.P. stations downstream from Koka. Included in the capital investment plans of the Ethiopian Electric Light and Power Authority for 1960-65 is a sum of nearly $\$7\frac{1}{2}$ million (Eth.) for preparatory work for the Malcasa hydro-electric power station downstream from Koka, near the bridge which carries the Nazareth-Asella road over the Awash. At the end of this five-year period, further H.E.P. stations are planned; for example, at Genfugalla near Metahara between Koka and Awash station.

In his inaugural speech at Koka on May 3, 1960, H.I.M. Haile Sellassie I observed that "this project has already been integrated, not only into the larger programme by which the Awash river will yield again and again of its treasures to turn the wheels of industry and to fructify the fertile soil of our homeland, but also into the yet broader programme including the Blue Nile, the Webi Shebelli, the Akobo, the Dindar, the Tacazze, the Mareb, and others."

Let us now turn to this broader programme.

2. Power Resources of the Blue Nile (Abbai) Drainage Basin

The Blue Nile drainage area has, on a number of occasions in the past, been the subject of investigation to determine the power possibilities of the region. In particular, the potential of the Abbai river itself at its outlet from the natural reservoir of Lake Tana, was the subject of inquiry.

Before the Italian occupation, the American firm of J. G. White, at the invitation of the Emperor and as

part of a general scheme for improvement of communications and power resources in the region, had commented on the feasibility of a H.E.P. station at the outlet of the Blue Nile near the falls of Tis Esat downstream from Bahr Dar. In Egypt, the Director of Water Resources, G. E. Hurst, had long been concerned with the full development of the whole Nile drainage basin. This naturally included control of the drainage from the Ethiopian highlands, since from this region come the seasonal floods which affect Egypt and the Sudan. Hurst's ideas were later embodied in his book " The Nile," and in reports to the Egyptian government * Hurst's scheme was based on the utilisation of Lake Tana as one of several large storage reservoirs from which water could be released during dry seasons and in years of low rainfall to regulate the flow of the Lower Nile. This scheme conflicts to a certain extent with the use of the outlet to Lake Tana as a power source, since, except during dry seasons, the outlet would remain closed by the barrage to be constructed. During the Italian occupation, there was naturally some investigation of the possibilites of this area, although no practical steps were taken. Some technical data was however assembled in reports and proved valuable after the war (see Bibliography).

In 1953, the British firm of J. Seymour Harris and Partners was invited by the Ethiopian Government to report on the development of the Tana region, in particular to make recommendations about the proposal to develop the small settlement of Bahr Dar to the status of a major administrative and industrial centre. The recommendations from this survey included the establishment of a hydro-electric power station near the present settlement of Bahr Dar. It is not proposed in this article to enter into a discussion of the wider issues involved in major H.E.P. schemes at the Lake Tana outlet. These issues include the problems of flooding of the lake margins, which are important to local agriculture; the submerging of historical monuments in the area; the possibilities of evaporation offsetting the advantages of the accumulation of the wet season precipitation in a large lake dammed at the outlet ; and the relationship between major works at the Tana outlet and the flow of water in the Sudan and Egypt. For further development of these topics, the reader is referred to the various reports of the surveys of the region listed in the bibliography.

Since 1956, the whole of the Blue Nile drainage basin has been the subject of intensive investigation to evaluate the resources of the area. The potentialities of the region for the development of hydro-electric power have been considered in relation to the possibilities for the agricultural and industrial development. To carry out this survey, technicians from the U.S. Bureau of Reclamation, and the U.S. Coast and Geodetic Survey working with the Department of Water Resources in the Ministry of Public Works and Communications have been assisted by finance from the Economic and Technical Assistance Board of the Ethiopian Imperial Government. This arrangement is the subject of a special agreement with the United States Government to assist with the study of the 120,000 square mile area. In May of this year reconnaissance reports of the survey team reported that the area "indicates possibilities for the development of hydro-electric power, small-scale industrial development and expansion of agricultural development." A preliminary requirement of this survey was the aerial mapping of an area of 113,000 sq. miles, together with the necessary ground geodetic control work. In connection with the latter, it has been necessary to relate survey points in the area with the Red Sea mean sea level at Assab and sufficient accurately computed bench marks have now been established in the area for accurate contour mapping to continue.

It will be some five years before the collection of data is sufficiently advanced for decisions to be made on major development projects in the area. It is clear, however, that the possibilities for development in this vast area, stretching from Gondar to the north of Lake Tana, to the headwaters of the Didessa river in Illubabor province, and from the Sudan border in the west, to the edge of the great eastern escarpment of the Ethiopian highlands, are probably unique in Africa. Addis Ababa, immediately to the south of the probable fault line of the Entotto Hills, is just outside the south-east rim of this vast region. Through the centre of the region flows the main stream of the Abbai river, rising at 1,840 metres in Lake Tana and crossing the Ethio-Sudan border at 340 metres. This represents a fall of 1,500 metres in approximately 1,000 kilometres and contrasts strongly with the gradient of 7 cms. per kilometre of the Nile in the Sudan and Egypt.

A number of possible dam sites in the main valley of the Abbai have been investigated, notably at the Tis Esat falls on the upper Abbai, and sites below the confluences with larger tributaries, e.g., downstream of the Guder-Abbai confluence, and the Didessa-Abbai confluence. The choice of these last two is based on the advantage of a large storage reservoir flooding up the mainstream and the tributary valley and is also made in the knowledge that the areas of highest rainfall in Ethiopia lie in the south-west of the Blue Nile basin. The headwaters of the Didessa and Dabus rivers lie in areas receiving more than 2,000 mm. of rain a year and, what is equally important in hydro-electric schemes, in areas with no dry season. In fact, one major difference between the present consideration of the potentialities of the Blue Nile basin and schemes which have been advanced in the past is the treatment of the whole of the Abbai basin as a unit for survey, and the shift in emphasis from the Abbai river itself. The major tributaries of the Abbai are the left bank tributaries and these rise in the high mountain areas forming the eastern and southern rims of the basin. These are all rivers with a permanent flow, and contrast with the seasonal nature of the streams from the northern and western regions of the basin. Thus the present investigations within the basin seem to lead to conclusions which dictate a number of smaller schemes spread throughout the whole area of the basin, sited on the tributaries of the Abbai, and chosen with regard to the availability of large areas of land suitable for agricultural development. These smaller H.E.P. sites can be integrated by a

* e.g. H. E. Hurst, R. P. Black and Y. M. Simiaka, "The Future Conservation of the Nile": Cairo 1946 (Physical Dept. Paper No. 51).

grid system with one or two major H.E.P. sites on the Abbai itself. A further reason for the emphasis on the tributary sites is the nature of the Abbai Canyon which precludes the use of the dammed water supplies for irrigation. The river at the Blue Nile Bridge on the road connecting Addis Ababa and Debre Marcos flows some 1,000 metres below the level of the plateau and is enclosed within a series of terraces with precipitous cliffs. As a spectacle, this Abbai canyon is second only to the Colorado Canyon in the U.S.A., but it is not suited to multi-purpose development, except perhaps in the lower reaches of the river near the Sudan border.

To conclude the discussion about the possibilities of development in the Blue Nile basin a comment should be made on the consideration of an alternative to the H.E.P. sites at the Lake Tana outlet near Bahr Dar. To the west of Lake Tana, the divide between drainage into the lake and drainage westward toward the Sudan border is only a matter of 15-20 kms. from the lake shore. To the west of the lake rim in western Gojjam and Begemder provinces there are large areas of land with good soil and a tropical climate, eminently suited to agricultural development, but with a rainfall of only 500-600 millimetres of rain a year. With adequate irrigation, these regions could produce valuable crops, notably cotton. The country to the west of Lake Tana is drained by the Dinder and Balas rivers and by the streams forming the headwaters of the Rahad river. At a number of points immediately to the west of the lake rim it would be possible to drive a tunnel which would drain water westwards from the lake and provide the necessary head of water for a H.E.P. station. The water discharged from the station would flow westwards for the irrigation of the western borderlands. This scheme would have to be coupled with a control system at the Lake Tana outlet near Bahr Dar to maintain the level of water in the Lake.

It is clear that the utilisation of a high proportion of the potential power resources in the Blue Nile basin is a project requiring a very high capital outlay. For this reason also the power schemes which are to be developed must be established with the general economic development of the region in mind, so that power and water consumers will eventually provide an income to defray the initial capital outlay. To this end, although the major decisions have yet to be made, and will probably not be made for at least five years to come, plans have already been made through the Economic and Technical Assistance Board of the Imperial Ethiopian Government and the United States Government, to utilise $1.3 million (Eth.) of economic development funds to further economic growth in the Lake Tana region. These funds are being used to develop town services (power and water) at Bahr Dar, and to develop the rural areas of Gojjam and Begemder provinces through the establishment of agricultural improvement stations, health centres, educational institutions and transport facilities.

A further stimulus to the region has been provided by the allocation of that part of the War Reparations Fund remaining free from the Koka H.E.P. project for the establishment of a cotton textile factory and H.E.P. power plant at Bahr Dar. This power plant at the Tis Esat falls some 30 km. south of Bahr Dar is designed for an output of 77 million kwh per year, but can be expanded as industrialisation proceeds in the region.

In general, the development of the Blue Nile area will raise the same kind of financial discussion as arose in connection with the Kariba Dam Scheme. A financial burden for the future will have to be accepted and funds sought from external sources, but it is perhaps worth recalling that only 6.7 per cent. of the £80 million sterling required for Kariba was raised by the Federal Government of Rhodesia. Power resources are clearly essential for economic progress and the alternatives to H.E.P. development are expensive. To provide the equivalent of the H.E.P. potential of 45 billion kwh per year would require an annual import of 22 million tons of coal (one tenth U.K. annual production) or 10 million tons of diesel oil (= annual production of Iraq and Iran).

3. Other developments

It is clear from Table 4 that the major potentialities for hydro-electric power lie in the Abbai river basin but, at the same time, development in this region cannot become a source of power supply for the whole country, and proper development of economic resources throughout the country demands that attention be paid to the creation of power supplies in other regions. Mention has already been made of the actual and further developments in the Awash river valley. Apart from these plans, the Ethiopian Electric Light and Power Authority has budgeted for capital investment over a five year period beginning September, 1959, in a number of different projects. These include reconstruction or extension of existing power plants and a number of new schemes designed to provide local facilities. The most important are the following:

1. Preparatory work for the new hydro-electric power station at Malcasa on the Awash river.

2. Construction of hydro-electric power station for Jimma on the Gibbi river.

3. Preparatory work for the new hydro-electric power station for Dessie on the Borkanna river.

4. Construction of a H.E.P. station for Ghion (Woliso) on the Walga river.

5. Construction of a H.E.P. station for Dembidollo on the Metti river.

6. Construction of a H.E.P. station for Neghelli, Arussi, on the Dababa river. This will be developed in connection with the small Kuyera Dam which is to be used also for irrigation purposes.

(continued at foot of next page)

The History of Ethiopian Airlines

CONTRIBUTED BY THE AIR LINES

In 1945 the Airline was formed by proclamation of H.I.M. The Emperor Haile Sellasie and operation was commenced in 1946 upon the purchase of six Douglas C-47's. International service was inaugurated between Addis Ababa and Cairo in April, 1946, shortly followed by service to Djibouti and Aden. Since that time Ethiopian Air Lines operation has been expanded into a network serving 12 countries. Foreign countries served comprise Germany, Greece, the United Arab Republic, Sudan, Yemen, Aden, French Somaliland, Kenya, Nigeria, Ghana and Liberia.

Internal operations were commenced at approximately the same time as service to Jimma and Gore as well as Debra Marcos and Gondar. The beginning of Airline service to these, and later-added domestic stations, opened new markets for products formerly unable to be shipped. Such items as coffee, which was growing wild and left uncultivated, now became an important item in the economy of Ethiopia. Truly, entry of Ethiopian Air Lines into these cities brought their products within easy reach of the markets of the world for the first time. Domestic expansion continued until today there are 29 cities served by Ethiopian Air Lines scheduled flights within Ethiopia.

In order to make this expansion possible, a great deal of development has been necessary in terms of local airport facilities and navigational aids. As an example, the Airline now owns a total of 14 domestic radio

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(continued from previous page)

7. Construction of H.E.P. station for Gore and Mattu on the Sor river.

8. Construction of a H.E.P. station for Assella on the Catar river.

9. New diesel power plants for Addis Alem, Lekempti, Shashamane, Makelle and Assab.

10. Extension to diesel power plants at Yrgalem, Debra Marcos, Soddu, Gondar and Jigjiga.

11. Building of dam for storage basin for H.E.P. station at Debre Berhan.

In all, these projects entail a capital investment of over $30 million (Eth.).

The various projects will fill the gaps in present urban services and will perform the useful function of creating a future demand for electricity for the time when large projects materialise. Present production and future production from the schemes then in operation is expected to total 148 million kwh by 1965 (excluding private generating capacity). This will be more than 2½ times the production in 1955.

Apart from the schemes now detailed, it can be seen from Table 4 that still further possibilities of development exist in other regions. The Webi Shebelli river system covers much of the Ogaden region and drains an area of some 200,000 sq. kilometres. It captures the drainage from the whole chain of the south eastern highlands of Ethiopia from Yrgalem to Sidamo province to Jigjiga in Harar province. At many points the headstreams of the Webi Shebelli offer possibilities for H.E.P. development to provide electricity for the rich farming regions of these uplands. The middle Webi Shebelli has also been surveyed for its general economic possibilities. This potentially rich region would benefit from a multi-purpose scheme supplying power and irrigation.

The three regions, Awash, Blue Nile and Webi Shebelli are the first three priorities in the planning of the Ministry of Public Works. The selection has been made in the light of the general economic importance of these areas. An even larger area of the country remains unsurveyed from the standpoint of potential power resources, and, in all, Ethiopia's potential is one of the richest in Africa.

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(Articles on the Koka Dam are to be found in "Ethiopian Observer," Vol. II, No. 10 and Vol. IV. No. 8—Note, Editor.)

stations equipped with modern radio apparatus and power units to provide the necessary electricity where commercial power is not available. Whereas no radio beacons existed in 1946, today there are four 1,000-watt and nine of lesser power output which are a substantial aid in providing safe navigation within the country These radio beacons are also utilized by other than Ethiopian Air Lines aircraft which operate over Ethiopia.

In December of 1950 Ethiopian Air Lines acquired two new pressurized Convair 240's. These aircraft were urgently needed to compete favourably in international markets and avoid circuitry which was necessary with the non-pressurized DC-3 operation. A third Convair 240, wholly financed and paid for by the Airline was purchased in mid-1956 to augment the Convair fleet.

In 1957 Ethiopian Air Lines saw the need for the purchase of a helicopter fleet. This fleet was not to be put on regular schedules, but rather rented or leased to various government agencies involved in the development of internal areas where no landing fields presently existed. Today the Airline has a fleet of six helicopters representing an investment of Eth.$900,000. This amount was paid for in its entirety out of Airline funds.

In 1956 it was decided that larger and more modern equipment was necessary to keep pace with competition. Accordingly, an order was placed for three new radar-equipped DC-6B's, making Ethiopian Air Lines the only African carrier having a completely radar-equipped international fleet. Specifications were established with the Douglas Aircraft Corporation resulting in an aircraft unsurpassed by any in the world. All equipment on this aircraft, both from flying and service standpoints, proved to be among the finest available. Work with the interior decorators resulted in one of the most beautiful and comfortable interiors ever designed.

Delivery of the aforementioned DC-6B's made replacement of the Convairs on the international routes advisable, allowing these same Convairs to be placed on domestic and regional services, thereby bringing faster more modern pressurized service to many cities for the first time. Further, delivery of the DC-6B's made



A friendly welcome at Addis Ababa airport.

planned route expansion to Frankurt, Germany, practical. This brought the capitals of the world within quick and convenient reach of Ethiopia through gateways at Frankfurt, Athens, Cairo and Khartoum. In 1960 the DC-6B's were placed in service between Addis Ababa, Accra and Robertsfield (Liberia) providing the first and only one-carrier service across Africa from coast-to-coast North of the Equator. Lagos, Nigeria, was added early in 1961.

Airline growth is normally measured in terms of (1) Passenger Miles Carried, (2) Number of Passengers Carried, (3) Freight Ton Miles Carried, and (4) Plane Miles Flown. Ethiopian Air Lines has, since its conception, shown a remarkable increase in all phases year after year. This growth factor indicates extremely progressive planning on the part of the national air carrier of Ethiopia.

Year	Passenger Miles	No. of Passengers	Freight Ton Miles	Plane Miles
1946	3,023,000	8,000	300,000	460,000
1947	4,500,000	10,000	350,000	960,000
1948	5,636,000	12,486	409,000	904,000
1949	9,535,000	16,937	957,000	1,199,000
1950	10,468,000	22,347	1,090,000	1,240,000
1951	17,268,000	36,795	1,132,000	1,539,000
1952	18,947,000	40,806	1,115,000	1,587,000
1953	20,262,000	58,603	1,444,000	1,945,000
1954	25,732,000	66,020	1,432,000	2,219,000
1955	30,618,000	67,023	1,680,000	2,691,000
1956	33,261,000	60,615	1,699,000	2,946,000
1957	39,192,000	87,605	1,679,000	3,197,000
1958	47,388,000	92,712	1,819,000	3,327,000
1959	55,680,000	95,597	2,199,000	3,649,000
1960	65,338,000	104,067	2,307,000	3,783,000

Following is a table reflecting (1) Operating Revenues, (2) Operating Expenses, and (3) Audited and Adjusted Net Profit or (Loss) for the period 1946 through 1960.

Year	Operating Revenue Eth. $	Operating Expenses Eth. $	Audited and Adjusted Net Profit (Loss) Eth. $
1946	1,106,000	1,723,000	(617,000)
1947	3,012,000	3,665,000	(986,000)
1948	3,082,000	2,967,000	(119,000)
1949	3,957,000	3,658,000	151,000
1950	3,675,000	3,559,000	151,000
1951	5,157,000	5,973,000	(762,000)
1952	5,586,000	6,300,000	(649,000)
1953	6,413,000	6,749,000	(310,000)
1954	8,074,000	7,665,000	379,000
1955	9,719,000	8,988,000	692,000
1956	10,598,000	9,786,000	734,000
1957	11,819,000	11,638,000	(34,000)
1958	15,387,000	14,946,000	(39,000)
1959	20,442,000	18,746,000	742,000
1960 (Est.)	23,664,000	19,691,000	3,205,000

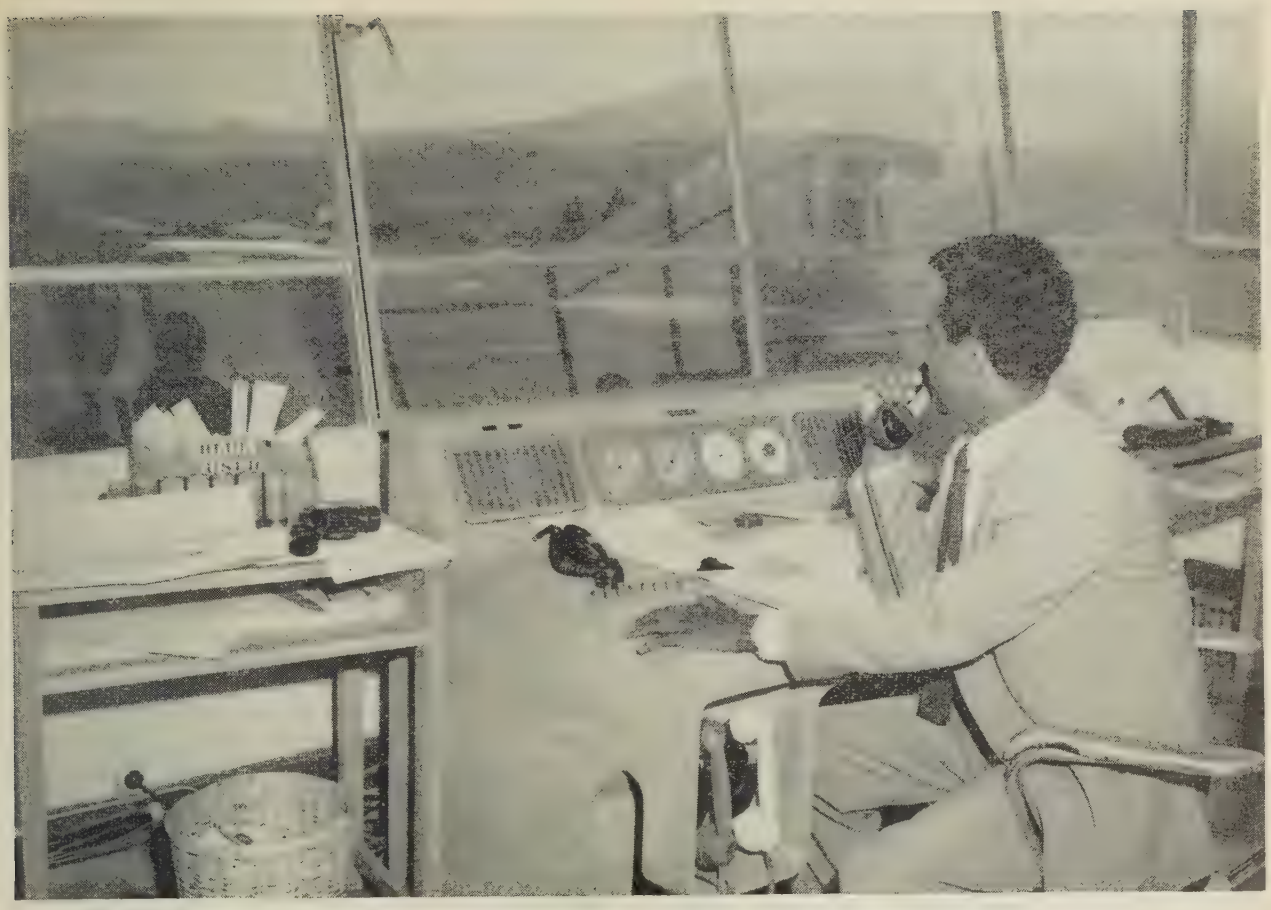
The above figures reflect certain losses during the period 1946 through 1948, and again for the period of 1951 through 1953. These losses for the most part can be attributed to the first expansion of Ethiopian Air Lines in the international market. Operation into Athens, for example, necessitating additional staff, additional airport facilities, additional purchase of equipment, resulted in expenses formerly not experienced. However, this is true of any normal expansion and after a period of experience it is found that the expansion results in increased profits, more than justifying the original additional expenses. Some of the above-mentioned losses can also be attributed to the purchase of Convair equipment, but again after this equipment was integrated into the system, resulting profits more than justified the basic expense. The purchase of three DC-6B aircraft permitted even greater expansion, and extensive studies were made to determine new markets to fully utilize this new fleet. Development of internal services will, of course, continue; however, present studies do not indicate the possibility of any major advancement in this area in the immediate future. It would appear that international operation presents the most practical area of expansion.

Over its fifteen-year history, Ethiopian Air Lines has grown steadily and today employs 959 people throughout its system. Approximately 75 per cent. of these personnel are Ethiopian nationals. Following the express desire of His Imperial Majesty, the Airline management has striven to train Ethiopian personnel in many positions of importance. The successful implementation of this policy is borne out by the fact that today Ethiopian personnel hold such vital positions as captains, co-pilots, radio operators, mechanics, accountants, salesmen and flight despatchers. Many Ethiopians occupy important supervisory positions in the Company. In addition, many Ethiopian girls are flying as hostesses and performing necessary clerical and secretarial duties.

On August 29, 1958, the Board of Directors of Ethiopian Air Lines, recognising the Airline's progress in becoming a major international carrier and realising the importance of closer co-ordination with the other airlines in the mutual development of standard airline practices, voted to join the International Air Transport Association. Our acceptance to membership in this organisation, effective January 1, 1959, put us on equal status with the other major airlines of the world. It also placed at the Airline's disposal, clearing house and conference facilities through which this organisation works.

Construction—Then and Now

In May of 1957, the Board of Directors approved the construction of an engine overhaul building to keep pace with the general airline growth and the acquisition of the new DC-6B's. Ground was broken for this new building on June 1, 1958, and the project was completed by the end of the year. This project financed under the Export-Import Bank Line of Credit cost approximately Eth.$2,500,000. This facility eliminated the necessity of having engine overhaul work done at foreign points on a contract basis. Of equal importance, the facilities enable Ethiopian Air Lines to train Ethiopian personnel in the newest, most modern



The Control Tower, Addis Ababa airport

methods of engine overhaul and aircraft maintenance, another step forward in the educational programme which is so important to the management of the Airline. In addition to engine overhaul facilities, the Airline also invested approximately Eth.$750,000 under the Export-Import Bank Line of Credit in expanding and establishing additional overhaul facilities for aircraft engine accessory units. This has further reduced maintenance costs. Plans for 1961-1962 provide for the construction of a new hangar, shops and office facilities at the new Addis Ababa airport site. Estimated cost for this work will run Eth.$2,500,000 and will be financed under terms of the Export-Import Bank Line of Credit.

Training

On-the-job training has been mentioned previously in this article, however, it is noteworthy that Ethiopian Air Lines management saw fit to request and subsequently have approved the participation of the I.C.A. in the form of the National Airlines Training Programme. Through this organisation modern, up-to-date methods and procedures, tested and proven by the airlines of the world have been brought to Ethiopian Air Lines. In addition, Ethiopian Air Lines operates its own training department which, in co-operation with the I.C.A. project makes Ethiopian Air Lines personnel more advanced, better trained and certainly more eligible for promotion than ever before possible. All these projects are aimed at the eventual goal of a completely self-sufficient Ethiopian Air Lines. This is most assuredly the mutual aim of His Imperial Majesty, the Ethiopian Government, and Ethiopian Air Lines management.

Jet Service

The year 1960 brought the Jet-Age to Ethiopia. In July of 1960 purchase by Ethiopian Air Lines of two Boeing 720B Jetliners provided for a much-needed jet link between Ethiopia and major areas in Africa and Europe.

Delivery of these 600 mile-per-hour medium range aircraft is scheduled for early 1962, subject to completion of financing arrangements and readiness of jet runways at Addis Ababa and Asmara under airport development programmes now in progress.

Selected by a Board of Directors headed by the Minister of Public Works and Communications, H. E. Dejazmatch Mengasha Seyoum, the luxurious Boeing jets were selected for the their versatile performance

over Ethiopian Air Lines' present routes linking Northern Europe with the Middle East and East Africa, and over the East-West trans-Africa routes which the carrier plans to inaugurate this year with Douglas DC-6B piston craft.

Equipped with four Pratt and Whitney turbo-fan engines which make it particularly suited to the variety of high altitude and high temperature airports served by Ethiopian Air Lines, the 720B is a development of the Boeing 707 model now in operation over the major long-haul air routes of the world. In the seating configuration likely to be selected by Ethiopian Air Lines experts, it will accommodate 110 passengers and their baggage plus approximately 8,000 pounds of cargo.

Taking off with a full load of passengers from Addis Ababa's 7,500 foot-high runway it will have a maximum range of 2,850 statute miles.

ETHIOPIAN AIR LINES COMPLETES AFRICA'S LARGEST ENGINE OVERHAUL BASE

Ethiopian Air Lines has announced the completion of its new engine overhaul base. The first engine to go through this overhaul procedure has just been completed and is now in the process of its final testing.

A decided need for facilities of its own was felt by Ethiopian Air Lines several years ago. Previously, all necessary overhaul was accomplished by shipping the engines to the United States. This procedure resulted in extremely high cost ratios and necessitated a larger inventory of spare engines than was deemed economically justifiable.

Officials of the airline decided that the facilities should be in close proximity to its existing maintenance facilities and its position adjacent to the existing maintenance base was selected. Original planning for these facilities was begun in December, 1957, at which time an order was placed for a Butler-type building and the necessary machinery, spare parts and equipment. Actual construction on the building began June 1, 1958 and was completed October 15, 1958. The overhaul shop, including the propeller shop, is approximately 120 feet square, and at maximum production will employ 45 persons.

Supervision of this facility is in the hands of Mr. Robert D. McRae, who arrived in Addis Ababa late in 1957 to supervise the over-all construction of the building and installation of the equipment. Mr. McRae operates under the guidance of Mr. P. C. Simpson, Director of Maintenance, and Mr. George F. Kuenstle, Supervisor of Overhaul for Ethiopian Air Lines.

Production in its early stages is based on approximately one engine per month; however, maximum capacity is expected to reach as many as 15 engines over the same period. At the present time there are three engines in various stages of overhaul.

The installation of Ethiopian Air Lines' engine overhaul facilities is expected to cost Eth.$2,250,000. However, in view of the anticipated savings in both direct and indirect costs, it is expected that this amount will amortize itself in a relatively short period of time. Even more important than the expected savings in cost to Ethiopian Air Lines is the ability more closely to control the maintenance of its own engines. This overhaul base is the only known type of operation on the continent of Africa of its size, and the only one able to handle the overhaul of the Pratt and Whitney R-2800 engines. These engines are the type used on the new Ethiopian Air Lines DC-6B all-radar-equipped fleet, as well as on the Convair fleet which has been in operation for several years. In addition to the overhaul of the aforementioned engine, extensive work will be done on the Pratt and Whitney R-1830 engine currently used on its Douglas DC-3 and C-47 fleet, and the Lycoming VO-435A engines which are part of its fleet of helicopters.

National Airlines Training Project

ARTICLE CONTRIBUTED BY THE N.A.T.P.

Ethiopians no longer turn their faces skyward in astonishment at the sound of an airplane passing overhead; it has become as familiar to them as other aspects of modern life. But the sound of an aircraft flying over Addis Ababa at night recently caused some citizens to run outdoors to see what it could be; others ran indoors to telephone the authorities.

The National Airlines Training Project, which has played a part in making daytime flying familiar, was responsible for the unusual night flying over the city. It was the beginning of local night flight training.

N.A.T.P. began operations in 1957 with the objective of setting up a continuing program to supply trained Ethiopian personnel to Ethiopian Airlines. It is a joint undertaking of the Imperial Ethiopian Government and Point IV, the U.S. aid mission to Ethiopia, through a contract with Trans World Airlines.

The project conducts training in airline piloting,

personnel supervision, aircraft maintenance and related categories. Six Ethiopian pilots with E.A.L. have qualified for the rank of Airline Captain, partially through training with N.A.T.P., and the project last month graduated its first class of 11 students who started with no experience and are now on duty as copilots with E.A.L. This pilot course lasts 18 months.

The 11 new pilots are Ato Assefa Ainalem, Ato Begashaw Ashine, Ato Bekele Bezuneh, Ato George Kebede, Ato Getahun Adera, Ato Haile Gebrehiwet, Ato Kahsai Ghermatzion, Ato Kefle-Mariam Mahari, Ato Zeleke Demissie, Mr. Robinson Kitenda and Mr. James Kiwanuka. The last two are from Uganda, now gaining a year's experience with E.A.L. before returning home. Ato George last month demonstrated both his skills and the project's ability to serve Ethiopia when he and N.A.T.P. flight instructor Lowell King flew American yellow fever vaccine and a vaccinating machine from Addis Ababa to Sashemene.

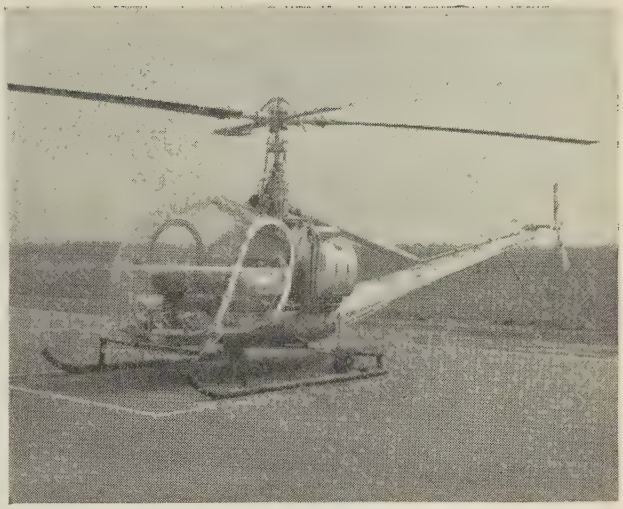
A new class of pilots started classes June 5. The 14 successful candidates were selected from 1,200 applicants. Of this large number, only 200 qualified on the application. Rejections were mostly for educational reasons, since the course requires a high school education or the equivalent. These 200 received a personal interview, which resulted in 100 being invited to take a written examination. Only 28 survived the examination—14 selectees and 14 alternates. One selectee was eliminated after a tough physical examination and an alternate took his place. This is a very high percentage to pass the physical. Between now and July 17, each student will get eight hours of dual flying instruction, and any one found lacking in flying aptitude may be washed out and his place taken by an alternate. Even after ground schooling and flight training begin on July 17, students may be washed out if they fail to meet minimum standards of performance.

This insistence on high standards of qualification and performance, though inevitably disappointing to some individuals, means that Ethiopian pilots meet the world's stiffest qualifications—essential to giving Ethiopia an airline to be proud of.

Progress in training Ethiopian pilots can be measured by this table of E.A.L. personnel:

	Captains		Co-pilots	
	Ethiopian	U.S.	Ethiopian	U.S.
1958 ...	1	22	22	6
1961 ...	7	16	25	4

N.A.T.P. has also put 68 Ethiopian employees of E.A.L. through a basic supervisory personnel course and 32 through an advanced supervisory course. In addition to classroom instruction, the N.A.T.P. instructor provides on-the-job training of E.A.L. sales personnel.



ETHIOPIAN AIR LINES' HILLER 12E

A three-place, 305 horsepower 12E helicopter, manufactured by Hiller Aircraft Corporation, belonging to Ethiopian Air Lines and used for utility and personnel transport. Highest powered of light helicopters, the 12E's high altitude performance is ideal in such areas as Addis Ababa, which is itself situated at nearly 10,000 feet.

The N.A.T.P. line maintenance instructor has trained six E.A.L. employees from the ground up and does additional on-the-job training of E.A.L. maintenance mechanics. He devotes about half his time to training and the other half to maintaining N.A.T.P.'s training aircraft—two Piper Cub two-seater airplanes and a Cessna 180 four-seater equipped with instrument flying facilities equal to those usually found on bigger planes.

The component overhaul instructor has also trained six E.A.L. employees from scratch and does on-the-job training as well. His advanced students can repair and overhaul the most intricate electrical and hydraulic mechanisms used in aircraft.

N.A.T.P.'s sheet metal specialist has trained 12 new mechanics and another six previously employed by E.A.L., in both classroom and practical courses.

N.A.T.P. has also qualified one Ethiopian Link Trainer instructor and is training another. The Link Trainer is a device which simulates flying—but the student never leaves the ground. All N.A.T.P. courses include the selection and training of future instructors. All training will eventually be done by Ethiopians, and American instructors are constantly being displaced by Ethiopians.

The co-directors of the National Airlines Training Project are Ato Ged Gebre Christos, Secretary General in the Minstry of Public Works, and Mr. John W. Robinson, chief of the industry and public works division of Point IV. Mr. John D. Gable of T.W.A. is the head of the instruction team.

An Introduction to

the

ECONOMIC HISTORY

of

ETHIOPIA

by

RICHARD PANKHURST

with a foreword by

K. M. PANIKKAR

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Ethiopian Airlines and Tourism

Contributed by Ethiopian Airlines

The following notes, prepared by Ethiopian Airlines, are intended as a guide to prospective tourists intending to visit Ethiopia.

General Information

The Empire of Ethiopia, including Eritrea, with an area approximately 400,000 square miles and a population of some 20 million, is situated in what is called the "Horn of Africa" in the north-eastern part of the continent, alongside the Red Sea. The southernmost tip is 250 miles north of the Equator. It is bounded on the west and north by the Sudan, on the north-east by the Red Sea, on the east by French Somaliland and Somalia and on the south by Somalia and Kenya. Its area is slightly more than that covered by 16 north-American states—the six New England states plus New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, Kentucky, Ohio and Michigan.

Much of Ethiopia is a vast plateau, having an average elevation of 8,000 feet and with a number of mountains which rise from 12,000 to 15,000 feet. Traversed by the Great Rift Valley and numberless other valleys and gorges thousands of feet deep, it is "one of the most spectacularly beautiful countries in the world," as John Gunther has declared. The fresh, clean air on the Ethiopian plateau invites the tourist to a climate new and different from that found in most other areas in Africa.

Ethiopia has many lakes and rivers, most of which are amazingly beautiful, with the luxuriant vegetation surrounding them making gorgeous settings. Lake Tana, Ethiopia's largest, is the source of the Blue Nile, which flows westward to Khartoum in the Sudan where it joins the White Nile to form the famous Nile River.

The country's famous monarch is His Imperial Majesty Haile Sellassie I, Emperor of Ethiopia, King of Kings, Elect of God, and Conquering Lion of Judah, who began his reign as Regent from 1916 to 1930 and has been Emperor since November 2, 1930.

Ethiopia is divided into 13 provinces including Eritrea, which was federated with Ethiopia on September 11, 1952. Each province is under a Governor-General, appointed by the Emperor, with authority administered by the Ministry of Interior. The country's leading city, and its capital, is Addis Ababa. Other cities and towns of significant size are Asmara, Dessie, Dire Dawa, Gondar, Harar and Jimma.

Transportation is the most highly developed tourist facility in Ethiopia at present although there are several excellent hotels. Ethiopian Airlines provide regular service to 30 cities and towns within the country in addition to maintaining dependable, scheduled international flights between Ethiopia and Germany, Greece, Egypt, Sudan, Kenya, Aden and Yemen. The Airline has a fleet of luxurious new DC-6B four-engine, radar-equipped transports in addition to modern, comfortable Convairs, DC-3's and C-47's.

A railroad runs between Djibouti in French Somaliland, a major international seaport, and Addis Ababa. Buses and trucks operate between all centres in Ethiopia and roads are rapidly being improved. Taxis are available in the larger cities and towns.

Addis Ababa has an automatic dial telephone system and many other cities and towns have local systems with connections to most of the leading communities in the nation. An international wireless telegraph system connects Ethiopia with the rest of the world.

The Ethiopians have a strong national consciousness and a pride in the fact that they have kept their independence for over 3,000 years. This is a record which few nations can equal or even remotely approach. They are largely an agricultural people, farmers and herdsmen. Terracing of the steep slopes has been practiced in Ethiopia as long as anywhere in the world. A Christian people since early in the fourth century, the majority are of the Coptic faith.

Climate

Despite its proximity to the Equator, Ethiopia's climate is one of the finest and healthiest in the world—compared by many to that of Mexico City—because of its plateau location with an average elevation of 8,000 feet.

Except in the lowlands which surround the country, Ethiopia's temperature is invigoratingly mild or even cool, having an average range of between 60 and 80 degrees Fahrenheit. Nights are invariably cool, requiring blankets for comfortable sleeping. The maximum temperatures are from March to May and the minimum occur in December and January, althoug the variation is slight. The average temperature in Addis Ababa is 62 degrees Fahrenheit.

There are two basic seasons in Ethiopia, the dry and the rainy, with the latter being divided into the "small rains" and the "big rains." The small rains which occur during February or March are generally intermittent showers with the sun always shining every day. The big rains, which comprise approximately 80 per cent. of the total rainfall, extend from mid-June or early July to late September. They normally last half a day, or less, with the rest of the day being sunny and pleasant. Some days it does not rain at all.

In fact, the rainy season in Ethiopia is no more unpleasant than the period of spring rains in many areas of the United States.

Visitors should bring clothing of the weights ordinarily worn in the fall and spring in the latitude of



The Holy Trinity Cathedral, Addis Ababa.

New York. Comfortable and serviceable clothing for trips into the country is the same as that required for similar conditions anywhere.

Addis Ababa

Addis Ababa ("New Flower") with about half a million population, is situated near the geographical centre of the Ethiopian Empire at an altitude of about 8,200ft. above sea level. The city extends over several eucalyptus-covered hills and is beautifully located in the midst of bowl-like encircling mountains which tower over its own high elevation. Its name of "New Flower" is very apt because a wide variety of flowers are commonly grown in Addis Ababa. There are many winding, hilly streets and avenues which afford magnificent views of the mountainous countryside.

Because Addis Ababa is not only Ethiopia's commercial and cultural centre but also its capital, there are many government buildings to be seen. These include the Parliament Building, all the Ministries and main government offices, the broadcasting station as well as the palaces of Their Imperial Majesties and of the members of the Imperial Family. The Imperial Palace is a most impressive building, set in a large park, with gates resembling those of Buckingham Palace.

No visitor to Addis Ababa should miss the Imperial Lions—the symbol of Ethiopia—which occupy a large round cage in a park near the Imperial Palace, nor the New Market. The latter is an amazing place with many open booths in which a tremendous variety of items are sold to the accompaniment of much shouting and noise and the invasion of donkey caravans, herds of cattle and occasional camels.

Since Christianity has been a dominant force in Ethiopia for 1,600 years, Coptic churches abound in Addis Ababa. Two of the most important are St. George's Cathedral and Trinity Cathedral. The Church of Mariam, west of the city, is particularly interesting for its paintings and bell tower.

Of much historical interest is the National Museum on the second floor of the National Library. Here may be viewed a collection of crowns and robes, shields,

swords, saddles and portraits which mirror Ethiopia of generations ago. The crown of Emperor Menelik II, the throne on which Emperor Haile Sellassie was crowned and a cross dating back to 523 A.D. are outstanding exhibits.

Her Imperial Majesty's Handicraft School may be of interest to many. Here girls are taught weaving, sewing, knitting and dyeing and boys learn to make jewellery, cutlery and other handicraft objects. Many of the items made in the school are offered for sale.

Addis Ababa is a city of statues and monuments. Some of the most important are the Menelik II Equestrian Statue, the Massacre Victims Monument and the Liberation Monument.

The contrasts of Ethiopia are nowhere more striking than on Churchill Road, a main Addis Ababa thoroughfare, on which herds of sheep and goats driven by barefoot herdsmen daily pass a magnificent auditorium with a large stage which can serve as an opera house, equal to many in Europe. It is a plush building with excellent acoustics, 35 scenery drops, soft blue carpeting throughout and highly modernistic lobby decorations which utilise 2,378 electric light bulbs. It will seat 1,360 persons in addition to the canopied box for the Emperor and his entourage.

How to Reach Ethiopia

Ethiopia is readily accessible by air from all parts of the world. Ethiopian Airlines link the European cities of Frankfurt and Athens with Ethiopia and East Africa. Because of the steadily growing demand for airline service to Ethiopia and East Africa, Ethiopian Airlines recently launched luxurious DC-6B service between Frankfurt, Athens, Cairo and Addis Ababa as well as the capitals of Sudan (Khartoum) and Kenya (Nairobi).

Any international airline which flies to Frankfurt or Athens may be taken. The schedules of many flights to Frankfurt or Athens are co-ordinated with those of Ethiopian Airlines so connections may easily be made. Within Ethiopia. Ethiopian Airlines serve 30 cities of the Empire. From Nairobi, connecting services are available to all parts of Central and South Africa.

Entry Procedure

Formalities for the visitor to Ethiopia are similar to those in many countries of the world. A valid passport, containing a visa, is necessary. Visas are issued by the Ethiopian Embassies, Legations or Consulates. Applicants are required to state the purpose of their visit and furnish satisfactory financial and personal references.

Prior to entering Ethiopia, visitors must be inoculated against yellow fever and smallpox. Typhus, cholera, typhoid and tetanus inoculations are optional and not required. The yellow fever inoculation must be dated 11 days prior to departure from Ethiopia. It is, therefore, recommended that the inoculation be obtained from an authorised station with the certificate indicating the source and lot number of the serum and carrying a World Health Organisation seal.

According to the Tariff Act of 1947, bona fide baggage is not subject to duty. It is, however, subject to normal taxes. Not more than one half-litre of alcoholic liquors, 50 cigars, 100 cigarettes and one half-pound of tobacco will be admitted duty-free. Visitors wishing to bring rifles, shotguns or ammunition should request proper clearance through the nearest Ethiopian Legation.

Currency

Ethiopian currency is based an the dollars and cents system, one Ethiopian dollar (Eth.$) being the equivalent of U.S. $0.40 and Eth. $7.00 equalling one Pound Sterling. Currency notes in denominations of 1, 5, 10, 50, 100 and 500 dollars are in general use, with copper coins of 1, 5, 10 and 25 cents being in circulation.

The State Bank of Ethiopia provides all types of domestic and international banking services. Foreign exchange control is in force.

Climate

The climate of Addis Ababa is unanimously agreed to be excellent and healthful for the Ethiopian and foreign population. The days are warm but not usually hot, with the maximum temperatures prevailing from March to May.

The nights are invariably cool, and sometimes rather cold. The main rainy season extends from July to late September.

Transportation

The advance of modern science in the world has brought new methods of transportation and communication that help to overcome the natural barriers to Ethiopia. These hindrances have been overcome by aircraft and automotive facilities.

Ethiopian improved highways are about 5,000 kilometres in length and they are supplemented by secondary roads and trails to make a total of 70,000 kilometres. On the trails in the hot dry areas, camels are used. The donkey is depended on almost universally as a burden bearer. Automobiles operate on highways and on about one fifth of the unimproved roads.

The principal railroad extends from the centre of the productive area, Addis Ababa, to the Red Sea at Djibouti, in French Somaliland. The Eritrean railroad runs from Massawa and Asmara westward to the Sudan border.

Ethiopian Airlines is a government-owned corporation. It maintains international schedules and serves interior cities with scheduled passenger and freight flights.

As for communications, air mail and radio keep the Ethiopian commercial people in touch with the world markets. Within Addis Ababa there are phones with automatic dialing and there is long-distance service to the principal cities.

Great improvements are constantly being made, particularly in the tele-communications and transportation fields.

Travel Information

Additional information about any aspect of tourist



The Jubilee Palace, Addis Ababa.

visits to Ethiopia may be obtained from the Imperial Ethiopian Mission to the United Nations, 120 East 56th Street, New York City, from Trans World Airlines, 380 Madison Avenue, New York 17, N.Y., from Torrey Stearns, Adams & Keyes Inc., 3 East 54th Street, New York 22, N.Y., or from any travel agent.

Addis Ababa Hotels

Addis Ababa has two hotels which are considered among the top hotels in Africa. These are the Ghion and the Ras. Both are open the year round and provide visitors with excellent facilities for a long or short stay. The Ghion has 100 beds while the Ras has 140 rooms with 200 beds. Many of the rooms have baths, some have showers and all are equipped with telephones.

The Ras is located on Churchill Road not far from the centre of the city. The Ghion rests on a hill overlooking Addis Ababa, in a setting of flower gardens and broad lawns.

A single room with bath and with full board comes at approximately $6.40 a day (U.S.), a double room with bath at $11.20 to $12 and a double room with sitting room and a bath at $14.40 to $16. A 10 per cent. service charge is added.

Other hotels in Addis Ababa with lower tariffs are the Itegue and the Guenet.

Local Transportation

Addis Ababa is the centre of Ethiopian Airlines' international and domestic system. The airport has facilities for the rapid and courteous disposition of health and customs formalities.

Transportation within the city is provided by a municipal bus system, a large fleet of taxis and the gerries—rubber tyred, one horse open vehicles for one or two passengers—which are as thick on the streets as the nimble little donkeys.

Ethiopian Airlines normally provide free bus transportation from the airport to hotels and vice versa for international passengers. Those wishing to use a special chauffeur-driven car are carried at the rate of $4 (U.S.) with one to four passengers per car.

For business transportation or sightseeing within the city limits, chauffeur-driven Chevrolet station wagons are available at $16 (U.S.) per day. There is an extra charge for distances beyond 100 kilometres.

Addis Ababa City and Suburban Tours

A number of sightseeing tours in and around Addis Ababa, as well as surburban excursions, are available. Cars with chauffeurs, including guide service, may be had for half-day tours at a per person rate of $10 (U.S.) for one or $32 for four.

Such half-day city tours include visits to many of the sights mentioned above as well as the business and shopping centres of the city. The tours also include Mount Entoto, a few miles north of Addis Ababa. This 9,000-feet high summit was the seat of government of Emperor Menelik II before he moved it to Addis Ababa. The trip to the top of the mountain provides extraordinarily beautiful vistas of the city below.

A drive to picturesque Lake Gafarsa for lunch may be arranged in connection with the tours. The Austrian restaurant at the lake offers a fine meal in beautiful surroundings.

One or two day excursions from Addis Ababa to the surburban towns of Debre Zeit, Ambo, Nazareth, Addis Alem and Wolisso are also available. These tours are offered in chauffeur-driven cars with a guide and may be obtained at rates, varying with the distance, from $7.20 (U.S.) to $14 per person for four persons and up to $24 to $48 for one person.

Overnight stops may be arranged at the Debre Zeit Hotel, the Mesfin Hotel in Ambo, the Acropole Palace Hotel in Nazareth and the Wolisso Hotel at full board rates varying from $3.60 for a single room to $8 for a double room.

Debre Zeit is a popular weekend resort for many residents of Addis Ababa because it is 1,000 feet lower than the capital.

The Debre Zeit Hotel is a modern building, six years old, with a magnificent view of one of the deep blue crater lakes. It has 25 rooms, 50 beds, two baths and 13 showers. The hotel serves excellent Italian food, charging from $1 (U.S.) to $1.20 for lunch or dinner and $8.80 for a double room including breakfast.

Asmara

Asmara in Eritrea with a population of 120,000, is an attractive city with wide streets and many imposing buildings. It is situated at an altitude of 7,600 feet and therefore offers the same healthy climate to be found throughout the plateau regions of the country. The city's rainy season is normally from the end of June to the middle of September and heavy tropical rains may be experienced during this period. In general, medium light clothing can be worn the year round although from November to February nights can be cool or cold.

Ethiopian Airlines provide Asmara with efficient international and domestic air service. There are several weekly international northbound flights to Cairo, Athens and Frankfurt and several southbound to Addis Ababa with frequent connections to Nairobi. Asmara is a connecting point also for flights to Hodeida and Taiz in the Yemen. Asmara is a major link as well for several domestic flights northbound and southbound.

Following the occupation in 1889 by Italy of the northern portion of Eritrea, the city became an Italian colonial capital with a population of some 3,000 Italians and perhaps 20,000 Eritreans. After 1934 the city boomed and expanded as the main base for the Ethiopian War and a leading city in the new Italian Empire.

Asmara today is a thriving industrial city with several modern factories for the manufacture of cotton yarn, ceramics, beer and matches, a large and flourishing market place, municipal buildings, churches, schools, hospitals, cinemas and night clubs. The city also has an army base of the United States, known as Kagnew Station, which serves as one of the most important radio sending and receiving posts in the Middle East.

Asmara has a first class hotel, the C.I.A.AO., with 100 beds, 50 rooms with bath and shower, an excellent restaurant and a popular bar. The hotel is open the year round. Good single rooms are available at $4.40 a day (U.S.) and double rooms at comparable rates.

Chauffeur-driven cars, including guide service, are available for tours of the city, including visits to the Asmara Palace (the former Italian seat of government), the Parliament Building, factories, the market, Kagnew Station, and Tsetserat Hill, from which a good general view of Asmara may be obtained. Prices range from $4.20 (U.S.) for four persons to $6 for two persons.

A modern city, Asmara offers visitors golf, tennis, polo, riding, as well as interesting trips through the lush countryside to such pleasant nearby towns as Keren and Agordat. Another favoured trip is on a winding road with many hairpin turns and remarkable mountain vistas which leads down 7,580 feet to the port city of Massawa on the Red Sea.

Massawa, the main sea gateway to Eritrea and northern Ethiopia, offers every port facility and such attractions as sailing, yachting, bathing and fishing. The city is built on two connected islands. Although from June to October the climate is uncomfortably hot, it is mild and enjoyable in winter and spring and attracts many visitors from the highlands. Massawa also has a C.I.A.A.O. Hotel, situated on the sea shore, with 120 beds, a garden, a swimming pool, open air dance floor, a good restaurant and bar.

Massawa is connected with Asmara by buses and by a narrow gauge railroad which winds through 36 tunnels in the mountains on its daily trips to and from sea level and the high plateau. Assab, Ethiopia's second sea port, is on the southeast tip of Eritrea near the southern end of the Red Sea.

Gondar

The ancient and historical Ethiopian city of Gondar located in western Ethiopia north of Lake Tana, contains many beautiful churches with ancient paintings of unique designs as well as several magnificent castles, still in an excellent state of preservation, which date back to the 17th century. For more than 200 years, Gondar was the capital of Ethiopia. On islands in nearby Lake Tana, the source of the Blue Nile, are



The Warm Water Swimming Pool, Ghion Hotel, Addis Ababa.

churches and monasteries containing some unusual paintings believed to have been made in the 14th century.

Ethiopian Airlines provide frequent service to Gondar. The flights give a striking view of the winding Blue Nile of the falls of the Nile and of the wooded ravines and mountains of the area.

Gondar boasts a clean modern hotel of 35 rooms with a swimimng pool and tennis courts. A single room with breakfast can be obtained for $4 a day and double room rates are comparable.

Aksum

Aksum, in north-eastern Ethiopia, believed to have been the Queen of Sheba's capital city, is the site of solid granite obelisks, the history of which is lost in antiquity. These are described as "stunning and mysterious" by John Gunther.

Aksum also is one of the religious shrines of Ethiopia because not far from the obelisks was built one of the earliest Christian churches in the country which is said to date back to 340 A.D. On its site now stands the Cathedral of St. Mary of Zion built in 1665 by Emperor Fasiladas in which for many years the Emperors of Ethiopia were crowned. The treasury of this cathedral still contains a rich collection of ancient crowns and imperial vestments.

Ethiopian Airlines does not at present provide service to Aksum but proposed improvements to the airport are expected to make this possible. In the meantime, the ancient city can be reached by car from Asmara in a trip of five hours in each direction.

The Touring Hotel in Aksum has eight double and two single rooms with two baths and two showers. Double rooms are priced at $4 (U.S.) and single rooms at $2.40. Good Italian meals are very reasonable.

Other Cities

Other cities in Ethiopia, such as Jimma and Dire Dawa, also offer interesting attractions to tourists. Both are served by Ethiopian Airlines.

There are many other potential tourist attractions in Ethiopia which are occasionally available to the general public by Ethiopian Airlines. One is Harar, an old walled city on the top of a winding mountain pass. Another is Lalibella which has some of the most unique

churches in the world—ancient monolithic edifices which were carved completely out of solid rock. There are many fascinating old paintings in these unusual churches.

The expansion plans of Ethiopian Airlines and Ethiopia's Department of Civil Aviation will, in the near future, make it possible for many tourists to add other areas to their itineraries.

Foods and Water

Most visitors to Ethiopia eat all their meals in their hotels although in the leading cities there are restaurants which serve local foods inexpensively. Local fresh food products are plentiful and reasonable although limited in variety to districts and seasons. Imported canned foods of practically all kinds are available.

The mainstay of the Ethiopian diet is injera which is dipped into wat. Injera is unleavened bread made in thin soft circular cakes from millet although wheat or barley may be used. The cakes are baked on iron plates over an open fire. Wat is a stew or curry made with either meat or vegetables and usually seasoned with red pepper and other spices.

The use of bottled mineral water is suggested.

Amusements

Both Addis Ababa and Asmara have several cinemas which are very popular. One of the cinemas in Addis Ababa is located in the new opera house on Churchill Road where frequent travelling shows also provide entertainment. Ethiopian plays are often produced while groups of foreigners have presented a series of very successful entertainments. There are very well attended weekly dances in the various Addis Ababa hotels.

Both cities also have facilities for golf, tennis, polo and horseback riding. Addis Ababa has a popular race track while for those who wish there is private flying.

A favourite game among adult Ethiopians is "ganna," played usually at Christmas. It is a form of hockey match with the goal posts in the competing villages. Another popular Ethiopian sport is "yeferas gooks," which is a spectacular display of horsemanship, dexterity and skill. It is much like the jousts of Old England, but with rhinoceros hide or ox-hide shields, no armour for defence and with light spears or lances for throwing as weapons. The riders cover a wide field and there are often many participants.

On Sunday afternoons, the Haile Sellassie Stadium opposite the Ghion Hotel in Addis Ababa is the scene of football or soccer matches which are well attended and enthusiastically cheered.

For the photographer, Ethiopia offers scenic splendours in profusion, subject matter of all kinds and clear mountain air. The riotous colourings to be found throughout much of the country justify the use of nothing but colour film. In particular, during or just after the rainy seasons, the limitless variations of greens, with brilliant blue skies and fleecy white clouds for backgrounds, present a fascinating field for the photographer.

Wild Life

East Africa is known throughout the world as one of the finest of all the "Big Game" areas, but Kenya, Tanganyika and Uganda are usually the only countries thought of in this connection. Ethiopia is in East Africa, and borders on Kenya; so it should come as no surprise that vast quantities of game are to be found in Ethiopia. The Ministry of Agriculture is in charge of issuing hunting licences.

Almost all of the big game animals to be found in the better known portions of East Africa are to be found in Ethiopia, some in even larger numbers, and there are at least two animals native to Ethiopia that can be found nowhere else in the world—the Mountain Nyala and the Walia Ibex. Elephant, buffalo, rhinoceros, giraffe, zebra, warthog, and most of the many varieties of antelope and gazelle, including the majestic Greater African Kudu and the graceful oryx, are plentiful in certain areas. Large numbers of leopards, lions, cheetahs, and other members of the cat family are scattered throughout the country.

Game birds are plentiful and varied in Ethiopia. A number of varieties of ducks and geese, including the giant spurlock, are to be found almost anywhere where there is water. Many other forms of water fowl can also be seen, including marabou, egret, storks, pelicans, cranes, flamingoes, and the sacred ibis. Other wild fowl are partridge and guinea fowl in abundance almost anywhere in the country, and the lesser birds such as quail, snipe, dove, pigeons, and grouse.

Many kinds of fish exist in large numbers in many of the lakes and rivers throughout Ethiopia. A very large variety of catfish, which is not only excellent to eat, but is also a surprising fighter, is found in some of the rivers. The largest will ruin almost anything but deepsea fishing tackle. There are crocodiles in the majority of the rivers, but they are wary and are difficult to kill.

Hunting parties or safaris are practical, but at present there are only a few professional hunters available, who will, on prior arrangements, make all the necessary preparations, as well as conduct individuals or groups on trips.

Access to some of the game areas is quite easy, being over fair roads, while to other areas only very poor roads exist, making transportation by air more practical.

Contrasts

One of the most interesting features in Ethiopia is the study in contrasts—contrasts of all sorts, and in an almost never ending procession.

A variety of sights and interests make Ethiopia almost unique; from cool mountain streams to barren deserts, from lush tropical vegetation to bleak and wind-swept mountain tops, from endless mountain ranges to vast rolling plains, and from the very old to the very new.

Variety and contrast are practically the keynotes for a visitor to Ethiopia. No matter what one's interests, they may be found in profusion. Types of people, their ways of life, animals, birds, trees, flowers, vegetation, terrain and climatic conditions, vary from one extreme to another. The casual visitor to Ethiopia, however, may not see the extent or extremes of these variations for Ethiopia is a vast country and would require a great deal of time to see in its entirety.



King George VI Road, Addis Ababa, showing the Martyr's monument.

Transportation in Ethiopia follows the same pattern of contrasts and extremes. From the ubiquitous donkey to the modern aeroplane, all forms of transportation means and methods are to be seen.

To reach some of the more interesting parts of Ethiopia, in fact, the most effective means of transportation is by mule, but this is recommeded only for the more hardy and sincere explorer. For the traveller with less time at his disposal, the most widely used transportation method is the aeroplane.

Distances are great, and the majority of roads in the more remote areas are poor, often requiring the use of a four wheel drive vehicle. By air, it is practical to fly to almost any portion of the country and then use jeeps or trucks for shorter distances.

Shopping

Both Addis Ababa and Asmara have a number of up-to-date shops where a wide variety of modern items may be purchased. The markets in both cities also offer many different types of souvenirs. There are shops in the smaller cities also but the variety of merchandise is considerably less. Ethiopian products which many visitors to Addis Ababa will treasure include colourful hand-woven rugs and hand-made jewellery—such as Ethiopian crosses—made by students at Her Majesty's Handicraft School in Addis Ababa. An interesting souvenir is "The Story of Solomon and Sheba", a unique painting containing sequence panels depicting the visit of the Queen of Sheba to King Solomon and the birth of their son, Menelik.

Ethiopian Calendar

Ethiopia has its own calendar and its own method of recording time, both of which differ substantially from those in use by western nations. The Ethiopian year begins on September 11 of the western calendar and the Ethiopian New Year's Day is known as "Maskaram 1." The Ethiopian Era, called the "Era of Mercy" is calculated from a date approximately seven years and eight months after the beginning of the western calendar.

Therefore, the period from January 1 through September 10, 1959 on the western calendar is the year 1951 on the Ethiopian calendar—or a date eight years behind the western year—while the period from September 11 through December 31, 1959 on the western calendar is the year 1952 on the Ethiopian calendar, or a date seven years behind the western year.

The Ethiopian year is divided into 12 months of 30 days each, with the remaining five days of the western calendar (or six days in leap year) being placed on the Ethiopian calendar after the last month of the twelve.

The Ethiopian day of 24 hours begins at sunrise and divisions of the day and night are reckoned from sunrise and sunset, that is 7 a.m. by western reckoning is 1 a.m. by Ethiopian time.

Calendar of Events

Ethiopia celebrates many holidays, of which 14 are outstanding. Three of these are regarded as national holidays and in the following list are marked with an (*).

January 7	Christmas Day
January 20	The Feast of the Epiphany
January 20	The Feast of St. Michael the Archangel
February 19	Commemoration of the Massacre of Addis Ababa
March 2	Commemoration of the Battle of Adowa
April 11	Good Friday
April 13	Easter Sunday
April 14	Easter Monday
May 5*	The Return of His Majesty the Emperor to Addis Ababa
July 23*	The Birthday of His Majesty the Emperor
August 22	The Feast of the Assumption
September 11	The Return of Eritrea and the Feast of St. John the Baptist
September 27	The Feast of the Finding of the True Cross, "Maskal"
November 2*	The Coronation of His Majesty the Emperor

Offices of Ethiopian Airlines

Addis Ababa—P.O. Box 1755, Haile Sellassie I. Sq., Ghion Hotel, Ras Hotel, Kekia Pasha Building, New Market, Telephone 3300.

Aden—Bank Flat Building, Steamer Point—Telephone 2138, Aidroos Road, Crater City, Telephone 2711.

Asmara—P.O. Box 222, Haile Sellassie I Avenue, 89-91, Telephone 841, 842.

Athens—10 Venezelos Avenue, Telephone 33032, 33139.

Cairo—36 Sharia Cherif Pasha, Telephone 79770.

Dire Dawa—Valendis Building, Telephone 69.

Djibouti—State Bank of Ethiopia Building, Telephone 281.

Frankfurt Am Main—Eschersheimer Landstr. 56, Telephone 559853.

Khartoum—P.O. Box 639, Wingate House, Wingate Avenue, Telephone 7180, 7597.

Nairobi—P.O. Box 2901, Windsor House, Stewart Street, Telephone 22180, 21936.

ETHIOPIA AND ERITREA

by Sylvia and Richard Pankhurst

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Internal Freight

by R.K.P.P.

Ethiopian Airlines have played an important rôle in the development of the Ethiopian economy by providing relatively inexpensive transport facilities to areas which were hitherto difficult, sometimes even almost impossible, of access. The Airlines, it will be remembered, came into existence early in 1946, well before extensive work on the roads. The history of the last 15 years has shown that even though the subsequent improvement of roads might at first lead to a decline in goods transported by air, this was soon offset by the general increase in trade resulting from development. In 1946, for example, the Addis Ababa—Jimma road was in so poor a state that the Airlines had almost a complete monopoly; when the Highway Authority began work on this road it was suspected that the demand for Airlines' services would fall; in fact, however, it continued to rise as the opening of the improved road stimulated the development of trade in the whole area. Air freight charges are sufficiently low to encourage the growth of trade in primary produce. Coffee, for example, is transported by air from Tipi or Mizan Teferi to Jimma for 21 cents a kilo, or from Beica to Jimma for 23 cents a kilo, while the rate from Jimma to Addis Ababa is no more than 21 cents per kilo. A graded tariff is in operation between Gore and Addis Ababa: coffee and beeswax are charged 15 cents a kilo, hides and skins 20 cents and other commodities 41 cents.

An examination of the freight carried on the internal routes reveals its very varied character; the Airlines stations in the different areas carry out several different types of local produce and bring back manufacturers' goods from all parts of the world.

Coffee, of course, is the most important local crop carried by air. Beans are dispatched in fairly large quantities from nine stations: Jimma, Tipi, Mizan



Aircraft of Ethiopian Air Lines lands at one of the numerous bush stations to load supplies.

Teferi, Gore, Bacco, Dembidollo, Bulchi, Beica, and Assosa. Four of these stations also handle considerable other produce: Jimma supplies the wooden stools for which it is famous; Mizan Teferi, pineapples and oranges; Gore, beeswax, hides and skins and a small amount of civet; Dembidollo, hides, skins and beeswax.

Mention may be made of the other stations dealing in local produce. These include:

Assab, which supplies fish to Addis Ababa and Dire Dawa.

Asmara, which supplies dairy produce to Addis Ababa and fruit to Assab.

Debre Marcos, which supplies eggs to Addis Ababa.

Debre Tabor, which formerly supplied honey and butter, this trade being now carried by road.

Dire Dawa, which supplies fruit to Assab and *chat*, the mild narcotic, to Aden and Jibuti.

Gambella, which supplies crocodile skins, and formerly a certain amount of oranges and papayas.

Ghinnir, which supplies jute ropes, sandalwood, hides and skins, and a small amount of beeswax.

Goba, which supplies dairy produce, such as cheese, butter, eggs, chickens, and even a certain number of sheep.

Metekel, which supplies honey.

Maji, which used to supply leopard skins until the trade was curtailed by restrictions on hunting.

Waca, which supplies a certain amount of millet.

The greater part of the above-mentioned produce was bound for Addis Ababa or for export.

In return the planes carry manufactured goods of all kinds, including canvas, calico, *shammas*, cloth, shoes, umbrellas, corrugated iron, and other articles of consumption—above all salt, sugar and tobacco. Such goods vary with the needs of the area—recent figures, for example, show a considerable increase in the transportation of building materials to Bahr Dar, occasioned by the decision to establish a hospital and school there.



Local produce ready for shipment to Addis Ababa by Ethiopian Air Lines.

It is no unusual sight to see planes carrying such varied articles as beds and mattresses, beer, whisky and liquors, oil cans and drums, ballot boxes, and livestock of all kinds.

The following figures for 1960, the last year for which data is available, show the freight carried out of the thirty stations at present in operation:

Freight—Domestic (in Tons), 1960

Out of	Freight
Adaba	8
Addis Ababa	740
Assab	34
Asmara	223
Assosa	7
Bacco	215
Bulchi	91
Beica	37
Bahr Dar	9
Debre Marcos	52
Debre Tabor	2
Dodola	10
Dembidollo	104
Dire Dawa	58
Danghilla	1
Gondar	27
Gambella	24
Ghinnir	31
Goba	68
Gore	250
Hossana	4
Jimma	675
Metekel	9
Maji	2
Motta	1
Mizan Teferi	260
Masslo	1
Soddu	19
Tipi	562
Waca	12
Total Freight	3,536

Early returns suggest that an overall increase of about 15 per cent. may be expected during the present year.

The Airlines have proved most useful in transporting livestock, particularly prize livestock, which would suffer if obliged to undertake long journeys by land.

The establishment of air services has inevitably been accompanied by considerable development in the vicinity of the various air stations. Places like Bulchi and Tipi were virtually unacquainted, for example, with corrugated iron until it was flown in by air, but many houses are now roofed with it. Airstrips at Beica, Bulchi, Mizan Teferi, Motta and elsewhere have been the nucleus for the growth of new towns whose houses and shops are clustered round the strip which serves almost as the main road.

The Airlines have, in fact, an important rôle to play in the development of Ethiopian rural economy.

INTERNAL PASSENGER TRAFFIC

Ethiopian Airlines have been no less important in enabling Government officials, traders and others to travel rapidly over the entire country. A recent count of persons travelling by air showed large numbers of persons travelling to attend markets, court cases, weddings and hospitals. One of the most interesting aspects of post-war Ethiopia has been the way in which the poorer members of the community have taken to aircraft. Nor are internal lines, in fact, so much more expensive than traditional forms of transport. The journey from Bulchi to Bacco, which used to take two days by mule, required an expenditure of about nine dollars as it was usually necessary to pay for the return of the animals. The Airlines now transport passengers from one airstrip to the other in 15 minutes, at a cost of only nine dollars.

The structure of internal passenger traffic may be seen from the following figures:

PASSENGER (DOMESTIC)—YEAR 1960

Out of	Passengers
Adaba	528
Addis Ababa	17,102
Assab	1,023
Asmara	6,073
Assosa	552
Awash	2
Bacco	682
Bulchi	799
Beica	926
Bahr Dar	1,720
Debre Marcos	1,454
Debre Tabor	633
Dodola	367
Dembidollo	2,513
Dire Dawa	3,933
Danghilla	33
Dessie	133
Gondar	2,534
Gambella	812
Ghinnir	876
Goba	2,547
Gore	2,791
Hossana	529
Jimma	5,266
Laliballa	57
Maji	304
Metekel	315
Masslo	151
Mizan Teferi	966
Motta	443
Neghilli	35
Soddu	475
Tessenei	487
Tipi	512
Waca	468
Total Passengers	58,041

Review of the Food and Agricultural Situation in Africa

Prepared by the Food and Agriculture Organisation

The rate of increase of agricultural production, and especially food production, in Africa appears to have slowed down in the last few years. For 1959/60, the latest season for which data are available, provisional estimates indicate that there was a slight fall in production from the level of the previous year. On a *per capita* basis, food production appears to have fallen below the prewar level for the last three years. The production statistics for basic food crops and livestock products in Africa are subject to a considerable margin of error, however, so that these data can be regarded as no more than approximate indications of the trends that have probably occurred.

The statistics of international trade are generally more reliable. The volume of the region's agricultural exports has increased rapidly throughout the postwar period, and there was a particularly sharp rise in the calendar year 1959. Because of lower prices, however, total earnings from agricultural exports have grown much more slowly. In 1959 prices, expecially for cocoa, coffee and cotton, fell steeply, so that export earnings were reduced in spite of the big rise in the volume of shipments. Imports of agricultural products, although still small, are increasing rapidly.

The African continent is so large and diverse that, in addition to the shortcomings in the statistics, such overall magnitudes can give only a very rough picture of the food and agricultural situation as it affects individual countries. They do, however, serve to draw attention to the main problems and issues of general importance. The remainder of this paper reviews in more detail the principal recent developments in agricultural production and trade and in food supplies and levels of nutrition, together with some account of longer-term trends. An Annex Table sets out details of the production of the more important crops in the continent as a whole in the chief producing countries for which statistics are available.

AGRICULTURAL PRODUCTION

Agricultural production in Africa increased rapidly until 1956/7, but in more recent years there appears to have been some slackening in the pace of expansion except for non-food products. In 1957/58 agricultural production is estimated to have fallen by about 2 per cent (Table 1), chiefly because of poor grain harvests as a result of drought in the countries of north-west Africa. Output recovered sharply in 1958/59 to a record level, though the increase in food production was smaller than that in agricultural production as a whole. Preliminary estimates indicate that there was again a slight decline in food production and in total agricultural production in 1959/60, but non-food production continued to increase.

Declines in production were rather widespread in 1959/60, both north and south of the Sahara, and cocoa, coffee and rice were almost the only products to show a large rise (about 10 per cent.) over the previous year. Small increases in wheat production in Algeria and the Union of South Africa were more than offset by lower crops in Morocco and Tunisia. Maize production was reduced in the Union of South Africa and the Egyptian Region of the U.A.R., but rice production recovered sharply in the Egyptian Region. Mauritius and Reunion had large sugar harvests, but production was lower in the Union of South Africa. Groundnut production declined in Nigeria and Senegal. Cotton production rose only slightly. On the other hand, both Ghana and Nigeria had record crops of cocoa, and coffee production increased in most of the major producing countries. The small output of livestock products appears to have remained approximately unchanged from the level of the previous year, though for this sector the statistics are particularly unreliable.

Prospects for 1960/61 production are still uncertain. The countries of north-west Africa have had better rains than in 1959, and wheat and barley crops are expected to show some increase over the low production of 1959/60. Sudan expects a record crop of millet and sorghum. In the Egyptian Region of the U.A.R. the acreage planted to cotton is estimated to have increased slightly, but rice production is likely to be a little smaller than in 1959/60. The severe cyclone damage in Mauritius and Reunion at the beginning of 1950 will sharply reduce their 1960/61 sugar crops.

Production in Relation to Population

From 1948/52 to 1959/60 the population of Africa is estimated to have been increasing at an average annual rate of 2.2 per cent. Total agricultural production appears to have increased at approximately the same rate, but there has been a lag in food production, for which the rate of increase is estimated as only 1.9 per cent. per year.

Per Capita food production fell sharply in 1957/58 and again in 1959/60 and is now estimated at about 5 per cent. less than before the war. While the fall in total food production is probably only temporary, and the upward trend is likely to be resumed in 1960/61, the deterioration in *per capita* food production for the past three seasons must rise to some concern. *Per capita* food production has fallen by about 8 per cent. since reaching a peak in 1956/57, and it is bound to take some years to make up this leeway, especially because of the accelerating rate of population growth.

Per capita production figures are, of course, only an indicator of the progress of consumption in relation to population growth. As they take no account

of changes in the level of imports and exports, they can give no reliable indication of trends in food consumption.

Pattern of Production

As noted above, food production has tended to increase more slowly than agricultural production as a whole. Compared with the average for 1948-52, food production had risen by less than 20 per cent. by 1959/60, as against an increase of almost 50 per cent. in non-food production. Non-food products (mainly coffee, tea, tobacco, linseed, castor seed, cotton, sisal, wool, and rubber) are produced primarily for export, so that production for export appears to have increased much more rapidly than production for domestic consumption. There has probably been little change in the overall composition of agricultural output, however, for non-food products account for only about 15 per cent. of the total[1]. Partly also, the slower increase of local food crops may be more apparent than real, as the export crops are generally much better documented.

The tendency for a more rapid increase in export production is confirmed by a comparison of the trends for basic food crops (grains and starchy roots) and all other crops. Since 1948/49 the production of basic food crops is estimated to have increased at an average rate of only about 1.5 per cent. per year, which is considerably slower than the growth of population and of agricultural production as a whole. In many areas these crops are grown in mixed plots, which makes their estimation particularly difficult, and crops such as cassava present additional statistical problems, as they can be left unharvested for more than one season. Even allowing for the faults in the statistics, however, it seems clear that there has been a considerable lag in the production of basic food crops.

The production of other crops has increased much faster, at a rate estimated at nearly four per cent. per year from 1948/49 to 1959/60. This group includes, in addition to the non-food crops listed earlier, mainly sugar, pulses, edible oilseeds, fruit, vegetables and cocoa.

From the few indications that are available it seems that the expansion of livestock production has been slower than that of crops and also slower than the growth of population, though it has exceeded the very slow increase in basic grains and roots. It is estimated that the 1959/60 output of livestock products was only about 15 per cent. more than the 1948-52 average, and that the average annual increase since 1948/49 has been about 1.7 per cent.

There are a number of other aspects of the pattern of agricultural production that are of particular interest, but the statistics are inadequate to indicate the trends that are occurring. A most important aspect is the transition from subsistence to commercial agriculture. The tendency for export crops to increase faster than those for domestic consumption is itself an indication of this movement. It would be useful, however, to have data on changes in the proportion of production for domestic consumption that is marketed, as a measure of the expansion of food supplies for the growing urban populations. The only statistical evidence of the pace of the overall transition to commercial agriculture is for the Congo, where total indigenous crop production and sales are estimated to have increased at about the same rate until 1954, but since then sales have risen much more rapidly. In 1959 the index of quantities sold stood at 186 (1947-49 = 100), as compared with 139 for the index of crop production.

Many countries in Africa are also attempting to increase the diversity of their agricultural production, both in order to lessen their dependence on a narrow range of exports and to improve the nutritional quality of diets. While it is not possible to obtain details of the progress of this movement, the above analysis suggests that there may have been some slight increase in diversity of production for domestic consumption, as the output of livestock products appear to have increased slightly faster than the basic food crops that dominate the diet in most areas. It must be repeated, however, that the statistics are inadequate for any very firm conclusions to be drawn, while, in any case, livestock production seems to have lagged behind the growth of population. In many parts of Africa livestock numbers are relatively larger, but sales of livestock products are limited by social attitudes to cattle as well as by lack of access to markets. Increased sales of livestock products would themselves help to ease the overstocking of pasture that is prevalent in many areas.

Trends in Crop Areas and Yields

The statistical data do not enable a detailed analysis of trends in crop areas and yields in Africa. Such data as are available, however, indicate that, as in the other less-developed regions the post-war expansion of production has come very largely from the enlargement of the crop area rather than from higher yields per hectare, though there have been small increases in the low level of yields for most of the major crops for which information is available. Yield data are generally not available for the main perennial export crops, however, such as cocoa, coffee, tea, sisal and rubber, for which there appear to have been substantial increases in yields in some countries.

Grain yields are highly variable in north-west Africa and in the drier areas bordering the Sahara. According to the F.A.O. indices of agricultural production, drought caused total agricultural production to drop in Algeria by about 10 per cent. in both 1955/56 and 1957/58, in Morocco by 15 per cent. in 1957/58, and in Tunisia by 21 per cent. in 1955/56 and 13 per cent. in 1957/58. The sharp falls in these countries in 1957/58 were the main factor in the decline in the production of the continent as a whole. In the Union of South Africa, the expansion of the wheat area in the summer rainfall zone, which has brought self-sufficiency in several recent years, appears to have added greatly to the annual variability of the crop.

Main Crops

Grains account for about a quarter of Africa's crop production. Rice has increased more rapidly than any other grain, and in 1959/60 production was double the pre-war level. Production has more than doubled in the

[1] On the basis of the price-weighted aggregates of the F.A.O. production index.

Egyptian Region of the U.A.R., the main producer, though the acreage varies sharply with the amount of water available for irrigation. Madagascar's rice output is now regularly above one million tons, and there have also been sharp increases in parts of West Africa and in the Congo. Maize production appears now to be about two thirds more than the pre-war level, though most of the increase was during the war and the earlier post-war years. Much of the more recent increase has been in the Union of South Africa. Here and in a number of other countries in Central and East Africa there has been a succession of record crops of maize in several recent years, which have sometimes given rise to export surpluses that have been difficult to dispose of. Wheat production has increased fairly rapidly in the countries of north-west Africa, the Egyptian Region of the U.A.R. and the Union of South Africa, though with sharp fluctuations from year to year. Barley production has fluctuated even more sharply, and the low crop of 1957/58 was even less than the pre-war average. Statistics of millets, sorghums, the starchy root crops (cassava, sweet potatoes, yams and cocoyams) and plantains, which are the remaining basic food crops, are too unreliable for analysis. It seems, however, that on the whole their production has increased relatively slowly.

Pulse crops are an important source of protein in some areas, and their recorded production has generally increased in recent years. Sugar is an important crop in Mauritius, Mozambique, Reunion and the Union of South Africa, in each of which production has increased very rapidly. Sugar production has also expanded sharply in the Egyptian Region of the U.A.R. where it is used mainly for domestic consumption. Citrus fruit is exported by the countries of north-west Africa and the Union of South Africa, and there is also a large output for domestic consumption in the Egyptian Region of the U.A.R. The expansion of output has been particularly striking in Morocco, where the production of oranges was insignificant before the war but now, at nearly half a million tons, is the largest in Africa. Banana production increased very rapidly in the earlier post-war years, but the expansion has now slowed down considerably. Wine production has fluctuated sharply from year to year especially in Algeria and Morocco, and in several recent years the regional total has been less than before the war.

Groundnuts are the major oilseed produced in Africa. Production has increased fairly rapidly in Nigeria and in more recent years in Senegal, the two principal producing countries, but the most spectacular increase has been in the Union of South Africa, under the influence of high guaranteed prices. The output of oil palm products, however, appears to have risen rather slowly. Olive oil production is subject to a two-year cycle of fluctuations, but the trend in the North African producing countries shows a sharp increase.

Coffee, which is a major export of many countries in Africa, has increased more rapidly than any other main crop, though the fastest increases of all have been for rubber and tea, of which production is smaller. 1959/60 coffee production was more than double the 1948-52 average and between four and five times the pre-war level. Cocoa production, on the other hand, has tended to stagnate until recently, and has sometimes been below pre-war levels, though there have been sharp increases in some of the smaller producing countries. In each of the last two seasons, however, there have been substantial increases in both Ghana and Nigeria, partly as a result of improved disease control measures, and it appears that a new rising trend may finally have begun. The small output of tea has grown very rapidly as has that of tobacco, which has doubled in Southern Rhodesia since 1848-52.

Cotton production is about 50 per cent. above the pre-war level, though in the Egyptian Region of the U.A.R., the main producer, there have been some variations in production depending on Government acreage allotments. Sisal production has more than doubled since the war, with especially large expansions in Angola and Tanganyika. The production of rubber in Liberia, Nigeria and the Congo was negligible befor the war, but partly under the influence of wartime shortages has since increased extremely rapidly.

AGRICULTURAL TRADE

Agricultural Exports

Agricultural products account for the great bulk of the export trade of most countries in Africa. The main exceptions are the Congo, the Federation of Rhodesia and Nyasaland, and the Union of South Africa, where there has been substantial mineral development.

The volume of Africa's agricultural exports has expanded very rapidly (Table 2). In 1959 the increase over the previous year was as much as seven per cent. and took the volume of exports to:—

TABLE 1.—INDICES OF THE VOLUME OF AGRICULTURAL PRODUCTION IN RELATION TO POPULATION GROWTH IN AFRICA

	Prewar Average	Average 1948/49–1952/53	1953/54	1954/55	1955/56	1956/57	1957/58	1958/59	1959/60 (Preliminary)
				Indices, 1952/53–1956/57 average = 100					
TOTAL PRODUCTION									
All agricultural products	73	89	98	100	102	106	105	109	108
Food products	74	89	98	100	102	106	104	106	105
Non-food products[1]	68	87	92	97	104	108	111	124	128
Grains[2]	70	86	99	102	101	106	98	101	98
Livestock products[3]	80	93	98	97	102	106	107	108	108
POPULATION	75	92	98	100	102	104	106	109	112
PER CAPITA PRODUCTION									
All agricutlural products	98	96	100	100	100	102	98	100	97
Food products	99	97	101	100	100	102	97	97	94

[1] Coffee, tea, tobacco, inedible oilseeds, animal and vegetable fibres, and rubber.
[2] These indices are based on price-weighted aggregates, and therefore differ from the totals of grain production shown in the Annex table.
[3] Food products only.

TABLE 2.—INDICES OF AGRICULTURAL TRADE IN AFRICA

	Prewar Average	Average 1948–52	1953	1954	1955	1956	1957	1958	1959 (Preliminary)
				Indices, 1952–53 Average = 100					
VOLUME OF GROSS EXPORTS									
All agricultural products	82	93	105	111	119	124	126	128	137
Grains	113	129	100	152	181	184	172	213	106
Vegetable oils and oilseeds (edible)	89	90	106	121	112	128	125	141	142
Beverages and tobacco	73	92	103	109	124	131	140	128	144
Agricultural raw materials	87	93	106	100	105	106	101	107	103
AVERAGE PRICES (UNIT VALUE) OF EXPORTS									
All agricultural products	31	99	95	102	93	90	92	92	83
Grains	39	85	98	82	77	70	67	63	67
Vegetable oils and oilseeds (edible)	26	97	97	93	87	93	95	84	86
Beverages and tobacco	27	91	99	122	103	89	91	110	90
Agricultural raw materials	31	111	88	90	88	90	95	79	74
TOTAL VALUE OF EXPORTS									
All agricultural products	25	92	99	113	110	111	116	118	114
Grains	44	109	99	124	140	129	116	134	71
Vegetable oils and oilseeds (edible)	23	87	103	113	98	119	118	119	122
Beverages and tobacco	20	84	102	133	127	116	127	141	130
Agricultural raw materials	27	103	94	90	92	95	96	85	96
VOLUME OF GROSS IMPORTS									
All agricultural products	62	88	99	96	104	121	129	127	143
Grains	60	92	93	64	77	117	134	131	195
VOLUME OF NET EXPORTS									
All agricultural products	89	95	106	116	124	125	125	129	134
Food products	122	106	114	167	161	151	136	174	104

Average export prices more than trebled between 1934-38 and 1948-52, but since then have fluctuated about a declining trend. In 1958, as a result of the recession in economic activity in the industrialised countries of the world, as well as the heavy pressure of supplies, export prices fell sharply for most products, and especially for cotton and other raw materials of agricultural origin. Cocoa prices rose steeply, however, so that average export unit values for the total agricultural exports of Africa were maintained in 1958 at the same level as in 1957. In 1959, on the other hand, cocoa prices joined the general downward movement and average export unit values for Africa's agricultural exports dropped by almost nine per cent. As a result total agricultural earnings fell by over three per cent., in spite of the large rise in the volume of shipments.

Agricultural export earnings are now some five times the rather depressed pre-war level, and have increased by about a quarter since 1948-52. These data and those in Table 2 are in current prices. Much of the gain in export earnings has, however, been wiped out by the general rise in prices. If the figures in Table 2 are deflated by the U.N. index of average export prices for maufactured goods in world trade, as a rough indicator of changes in "real" values, it appears that the rise of about 70 per cent. in the volume of exports since the pre-war period has brought the total "real" value to more than twice the pre-war level. In comparison with 1948-52, however, the volume of exports was nearly 50 per cent. larger in 1959, as against an increase of only 15 per cent. on their " real " value.

The beverages and tobacco group (coffee, cocoa, tea, wine and tobacco) is the most important in the agricultural export trade of Africa, and accounted for about 40 per cent. of the total value of its agricultural exports in 1955-59. Coffee has been the main contributor to the rapid rise in the volume of exports of this group. Coffee prices rose very sharply until 1954, but in 1955 they fell by more than a quarter; from 1955 to 1958 they fluctuated about a declining trend and in 1959 dropped by about one-fifth. In line with the trend of production, the volume of cocoa exports has increased very little and has fluctuated sharply from year to year. In 1958 cocoa shipments were even less than before the war, though they recovered in 1959 and the recent renewed expansion of production should bring a sharp rise in export volumes, once consumption in the importing countries reacts to the present lower prices. As a result of the limited supply (Africa provides about 70 per cent. of world exports), cocoa prices rose steeply until 1954. A sharp decline followed; there was some recovery in 1958, but a renewed fall in 1959 and the beginning of 1960. The small volume of exports of tea and tobacco has risen rapidly but wine exports have tended to stagnate at about 20 per cent. above the pre-war level.

Agricultural raw materials are the second most important commodity group, and represent nearly 30 per cent. of the total value of agricultural exports. The volume of cotton exports has increased steadily, and with a very sharp expansion on 1959 was more than a third higher than in 1948-52. Exports of sisal and rubber have grown even more rapidly. The Union of South Africa is the world's fourth largest exporter of wool; exports had been declining for some years until 1959, when they recovered sharply. Prices for all these products were severely affected in 1957 and 1958 by the recession in economic activity in the industrialised countries, but most of them showed some signs of recovery in late 1959 and early 1960. It should be noted that the data for agricultural raw materials in Table 2 do not include hides and skins, which are a major export in many parts of Africa but for which statistics are very inadequate.

Vegetable oils and oilseeds are the next most important group, accounting for almost 20 per cent. of the total value of agricultural exports. Exports of groundnuts and oil have increased rapidly, and in some countries, especially Senegal and Soudan, an increasingly large proportion of the total is exported in the form of oil. The volume of palm oil exports has increased much more slowly, however, and those of palm kernels are only a little more than before the war. As indicated earlier, the production of oil palm products appears to have increased relatively slowly, while especially for palm kernels, higher domestic demand has also affected the level of exports. Average export prices for the oils and oilseeds group

as a whole rose rapidly after the war, but have slowly declined over the past decade. With the reduction of exports from the Far East, Africa now accounts for about 40 per cent. of world exports of edible oils and oilseeds, as compared with about 35 per cent. before the war.

Grains and fruit, the principal remaining commodity groups, play a relatively small part in the agricultural exports of Africa as a whole but are of considerable importance in several individual countries. Wheat and barley exports from the countries north of the Sahara have fluctuated very widely, and the region's 1959 exports of wheat were only one third of the record level of 1955. Madagascar's rice exports reached nearly 60,000 tons in 1958, but were halved in 1959. Grain prices have been declining since about 1953, with the heavy supplies on world markets. The volume of exports of oranges from North Africa and the Union of South Africa has risen at a spectacular rate. Banana exports, especially from the Cameroons, have also increased rapidly, though in 1958 and 1959 shipments declined sharply from the record 1957 level.

Agricultural Imports and the Net Trade Position

Africa is a substantial net exporter of agricultural products, and its gross imports amount to less than 30 per cent. (by value) of its gross exports of these commodities. The volume of imports has increased slightly faster than exports, but because imports are so much smaller net exports have fairly closely followed the trend of gross exports. Net exports of foodstuffs, however, have fluctuated sharply. In 1959 the volume of gross imports of agricultural products rose by as much as 12 per cent. and the greatly expanded imports and reduced exports of grain caused a fall of well over a third in net exports of foodstuffs.

Only for wheat and flour, and tea, do the region's gross imports substantially exceed its gross exports, though the net imports of condensed and evaporated milk are also beginning to assume important proportions. Smaller net imports include potatoes, some vegetable oils, prepared and canned meat, butter and cheese. Gross and net imports of most of these commodities have grown rapidly. Gross imports of wheat and flour in 1959 were more than nine times as high as before the war. This, and also the substantial increases in imports of potatoes prepared and canned meat, and dairy products, is to some extent an indication of changes in diets that are occurring with urbanisation and rising incomes. The largest importer of wheat and flour is the Egyptian Region of the United Arab Republic, but its imports have fluctuated sharply from year to year, varying from a million tons in 1951 to less than 100,000 tons in 1954 and 1955. There were no imports of wheat and wheat flour into the Union of South Africa in 1951 and 1958, as a result of two successive record harvests, but they rose again to 370,000 tons in 1959. The increases in imports of potatoes, canned meat and dairy products are spread over most of the continent, though imports of prepared meat go mostly to Ghana. Imports of tea, especially to Morocco and the Union of South Africa, have grown rapidly; those of the Egyptian Region of the United Arab Republic have remained fairly stable in the last few years.

Of the products for which exports generally exceed gross imports, there is regularly a substantial gross import only of sugar and rice. Gross imports of sugar have risen to about two and a half times the pre-war volume. This very rapid increase also reflects urbanisation and rising incomes and is spread over most of the continent except for a few areas where there is substantial local production (and also exports). Morocco accounts for about one-third of the total sugar imports. For rice Africa is a large net exporter in some years and a large net importer in others. On the gross export side, there are large fluctuations in the exports of the Egyptian Region of the United Arab Republic, which fell from 386,000 tons in 1958 to only 40,000 tons in 1959. With the worldwide shortage of rice after the war, gross imports fell to less than a third of their average pre-war level, but in 1955 and 1956 with the improvement in supplies they recovered sharply to approximately the same as before the war. Since then there have been rather sharp annual fluctuations. The main importers of rice are some parts of the former French West Africa, Mauritius, Reunion, the Union of South Africa, and Zanzibar. There was also a fairly large gross import of maize into some countries in the earlier postwar years, in some of which Africa as a whole was actually a net importer. This position had mainly been determined by harvests in the Union of South Africa and sharply fluctuating imports into the Egyptian Region of the United Arab Republic. Following very large crops in the Union of South Africa from 1952/53 onwards, Africa's net exports have recovered and in some years have been double the pre-war level. In parts of East and Central Africa maize imports and exports fluctuated rather sharply from year to year.

FOOD SUPPLIES AND NUTRITION

As noted earlier, the statistical information on which to base an assessment of the level of food consumption in Africa is far from satisfactory. In other regions the Food Balance Sheet method enables the estimation of national *per capita* food supplies on the basis of statistics of production, trade and distribution. Such information is available for very few countries of Africa, however, and knowledge of consumption levels is based on the dietary surveys that have been carried out in some countries. These surveys are not always sufficiently comprehensive and their geographical coverage is still far from enough, but they provide useful information about the pattern of consumption.

Millets and sorghums are the staple food in all the drier areas bordering the Sahara and Kalahari deserts. Maize assumes greater importance where the rainfall is a little higher, and is the staple food in wide areas, especially in East, Central and Southern Africa. Wheat and barley are the main food crops in the countries north of the Sahara, and rice in a few limited areas, particularly in Madagascar and parts of West Africa. In the forest zone, especially of West and Central Africa these grain crops tend to be mainly replaced by the starchy root crops (cassava, sweet potatoes, yams and cocoyams) and plantains.

Dietary surveys indicate that a very large proportion of total calorie intakes comes from these predominantly

(continued at foot of page 254)

ANNEX TABLE.—PRODUCTION OF MAJOR CROPS, AFRICAN CONTINENT AND PRINCIPAL PRODUCING COUNTRIES[1]

	Prewar Average	Average 1948–52	1953/54	1954/55	1955/56	1956/57	1957/58	1958/59 (P	1959/60 reliminary)
				Thousand Metric Tons					
Wheat	3,860	4,300	5,340	6,060	5,410	5,910	5,240	5,400	5,200
Egypt	1,184	1,113	1,547	1,729	1,451	1,547	1,467	1,412	1,443
Algeria	952	996	1,101	1,392	1,306	1,536	1,359	1,129	1,105
Morocco	648	787	1,182	1,342	1,030	1,114	744	1,281	956
Union of South Africa	427	558	526	600	830	830	788	657	720
Tunisia	385	452	580	624	395	477	499	539	517
Barley	2,880	3,380	3,790	3,960	2,980	3,870	2,420	3,430	2,700
Morocco	1,186	1,481	2,010	2,342	1,493	1,844	796	1,590	1,119
Algeria	704	808	723	935	693	1,023	616	780	642
Tunisia	167	218	180	170	81	156	185	282	239
Egypt	225	123	103	116	127	129	131	135	142
Maize	6,200	8,400	10,200	10,200	10,500	10,900	10,200	11,000	10,300
Union of South Africa	1,995	2,453	3,539	3,397	3,391	3,926	3,343	3,659	3,671
Egypt	1,616	1,378	1,853	1,568	1,714	1,652	1,498	1,758	1,397
Rice (paddy)	2,200	3,450	3,300	3,800	4,100	4,300	4,700	4,000	4,400
Egypt	609	971	652	1,118	1,309	1,573	1,709	1,082	1,535
Madagascar	613	829	1,025	991	1,025	955	1,120	1,100	1,040
Sierra Leone	187	260[2]	222	224	220	220	228	236	226*
Congo (former Belgian)	60	152	177	179	198	185	179	173	180*
TOTAL GRAINS[3]	25,230	30,760	35,570	35,920	35,230	37,010	34,130	35,530	34,180
Sugar (raw value)	1,100	1,560	1,870	2,050	2,240	2,270	2,455	2,555	2,615
Union of South Africa	409	555	658	658	752	770	871	1,016	853*
Mauritius	278	443	512	499	533	573	562	526	580
Egypt	146	196	271	319	312	299	306*	329*	320*
Reunion	81	116	171	175	177	193	208	165	200
Mozambique	72	86	90	90	124	139	164	153	165
Wine	2,140	1,720	2,270	2,510	2,070	2,490	2,160	2,050	2,530
Algeria	1,788	1,350	1,829	1,925	1,440	1,862	1,529	1,383	1,858
Union of South Africa	133	228	255	288	322	283	286*	285*	285
Morocco	54	64	119	191	191*	225	177	210	275
Tunisia	165	74	66	105	112*	130	160	195	190*
Oranges	530	990	1,220	1,240	1,360	1,370	1,450	1,400	1,540
Morocco	29*	170	178	206	243	281	348	385	476*
Union of South Africa	132	199	228	270	274	289	338	291*	305*
Algeria	91	239	327	324	341	372	337	340	302
Egypt	184	263	324	295	327	282	267	303	300
Bananas	300	350	460	470	550	550	600	600	600*
Somalia	—	36	60	55	73	65	60	83	—
Egypt	—	39	38	37	50	48	44	48	—
Congo (former Belgian)	—	16	39	26	38	45	49	42	48
Ethiopia	—	23	22	21	24	25	28	28	—
Olive Oil	70	90	140	120	60	170	90	200	110
Tunisia	45	53	93	61	25	101	50	135	37
Algeria	12	18	24	27	16	23	17	17	30
Morocco	10	13	16	27	14	37	7*	25	18*
Palm Kernels	690	740	810	830	780	860	800	870	850
Nigeria[4]	—	373	441	469	430	470	420	468	440
Congo (former Belgian)[5]	128	117	119	118	120	140	146	144	140*
Sierra Leone[6]	—	74	70	69	59	59	54	56	59
Palm Oil	620	820	870	920	890	960	920	960	950
Nigeria[7]	—	348	420	450	420	460	409	457	433
Congo (former Belgian)[5]	—	202	180	196	197	221	234	225	—
Groundnuts (in shell)	1,900	2,420	3,040	2,800	3,240	3,440	4,090	3,700	3,530
Nigeria	550*	684*	870*	790*	1,000*	770*	1,300*	1,050*	900
Senegal[8]	491	420	551	390	539	712	808	675	—
Union of South Africa	14	105	202	196	223	182	142	194	173
Sudan	6	20	38	44	65	146	129	138	139
Copra	100	100	120	120	120	120	120	120	120
Mozambique[9]	36	46	46	44	48	52	59	54	38
Coffee	140	290	340	380	490	510	540	590	630
Ivory Coast[8]	—	58	49	85	98	117	104	158	—
Uganda	—	35	35	34	75	62	79	71	109
Angola	17	55	45	69	85	81*	77	88	95
Congo (former Belgian)	17	21	23	28	29	39	43	54	55
Madagascar	24	31	45	44	55	57	56	53	48
Ethiopia	20*	34	40	46	54	52	57	48*	48
Cameroons	2	9	10	11	14	19	23	27	30
Kenya	18	10	12	13	24	19	21	24	24
Tanganyika	15	14	15	20	19	23	21	23	25
Cocoa	490	500	470	490	530	580	460	570	630
Ghana	280	253	214	224	241	268	210	260	315
Nigeria	94	109	100	91	116	137	90	142	150
Cameroons	25	49	54	56	58	60	65	60	63
Ivory Coast[8]	—	53	57	73	71	73	46	56	—
Tea	9	19	20	27	30	34	34	40	44
Nyasaland	4	7	6	8	8	9	8	11	11
Kenya	4	6	6	8	9	10	10	11	13
Tobacco	70	140	160	150	170	160	180	200	200
Southern Rhodesia	11	44	55	56	75	62	67	82	96
Cotton (lint)	600	690	670	700	690	730	760	870	890
Egypt	400	396	318	348	335	325	405	446	457
Uganda	59	66	73	54	65	69	69	73	65*
Congo (former Belgian)	31	46	45	48	49	52	46	48	60*
Mozambique	16	29*	33	28	21	35	39*	43*	38*
Nigeria[10]	10	14*	26	34	28	25	42*	30*	38*
Tanganyika	10	10	9	18	22	24	31	31	37*
Sudan	56	74	91	89	95	128	49	128	122*
Sisal	160	230	280	290	300	310	330	350	360
Tanganyika	90	137	172	181	179	189	188	200	104
Angola	6	21	31	31*	41*	37*	46*	53*	52*
Kenya	30	38	39	35	39	40	42	47	49
Mozambique	22	19	22	25	27*	29	31*	33	28*
Rubber	10	60	80	90	100	120	120	130	140
Liberia	2	31	35	38	39	39	39	43	43
Nigeria	2	14	22	21	31	39	40	42	53
Congo (former Belgian)	1	10	18	23	26	33	34	35	40

1 Production statistics are not available for all of the major producing countries. In particular few data are so far available for the individual countries of the former French Equatorial and French West Africa.
2 Four-year average.
3 Including also millets and sorghums, oats and rice (milled equivalent).
4 Purchases for export.
5 Plantation production and production from fruits delivered by African growers.
6 Exports.
7 F.A.O. estimates.
8 Marketed output.
9 Exports of copra and coconut oil in copra equivalent.
10 Purchases by Marketing Board.
— Data unavailable.
* Unofficial data.

Analysis – Recent Trends in African Trade

Prepared by the Economic Commission for Africa

(a) General Developments

Between 1958 and 1959 total African exports and imports followed very closely the behaviour of exports and imports of primary exporting countries in general. Roughly in line with the overall increase in exports of the latter, African exports recorded an impressive rise in volume of somewhat over 10 per cent while the corresponding increase in value was less than five per cent. Imports, on the other hand were below the 1958 level in both volume and value terms—two per cent and six per cent respectively. The divergent movements of exports and imports brought about improvement in the region's overall balance of trade. Exports, expressed as a percentage of imports, rose from 73.7 per cent in 1958 to almost 81 per cent in 1959. The average unit value of African exports, which had already declined between 1957 and 1958, showed a further decline of some five per cent; but, since the import unit value also fell by four per cent, the deterioration in African terms of trade between 1958 and 1959 was not greater than one per cent.

The figures for the first quarter of 1960 show a further increase in African exports but also—in sharp contrast to the 1959 developments—a substantial rise in imports, in both volume and value. This change in the movement of imports probably reflects the higher level of export proceeds achieved in 1959, with due regard to the usual time lag.

TABLE A/II. 1.—GLOBAL INDICATORS OF AFRICAN TRADE
Index Numbers: 1953 = 100

	Exports			Imports			Terms of Trade	Exports as Percentage of Imports
	Value	Unit Value	Quantum	Value	Unit Value	Quantum		
1957	122	101	121	130	102	127	99	75·7
1958	119	98	121	131	100	131	98	73·7
1959	125	93	134	123	96	128	97	80·8
1960 (1st Qtr.)	131	92	142	136	97	140	96	—

Source: *UN Monthly: Bulletin of Statistics*, October 1960.

The trends in total African exports and imports, however, conceal a great many divergencies in the development of trade in various groups of African countries and territories and even more, of course, in the trade of individual countries and territories. Various criteria may be used in grouping African countries and territories, none of them of more than a limited value.

The grouping in the table below, which is based on currency affiliations, disclose some interesting features relating primarily to countries belonging to the Franc Zone. Contrary to the behaviour of the two remaining groups, the relative trade position of the Franc Zone countries and territories does not seem to have been affected by fluctuations in demand for primary commodities either between 1957 and 1958 or between 1958 and 1959. The figures also show that these countries

(continued from page 252)

starchy crops. They also suggest that calorie intakes generally more or less coincide with estimated requirements, except in those areas where there are sharp seasonal fluctuations giving rise to the well-known "hungry season" before the harvest. This occurs mainly in the drier areas immediately south of the Sahara desert, but little exact information is available on its frequency or severity. In addition to low and fluctuating rainfall it is associated with inadequate storage and sometimes, in the neighbourhood of large centres of population, with excessive sales of food in relation to farm needs. In the North African countries harvests also fluctuate sharply from year to year, but while the diets of at least some sections of the population must be affected, there are also large effective fluctuations in the level of imports and exports of grains.

It is also evident from the dietary surveys, as well as from clinical information, that the quality of the diet is far from satisfactory in almost all parts of the region. Intakes of protein, especially animal protein, and of the necessary vitamins and minerals are very low. The quality as well as the quantity of the diet appears to suffer during the "hungry season".

Information on the trends in food consumption levels is even more scanty. The production indices discussed earlier indicate that since 1956/57 *per capita* food production has fallen by 8 per cent., and in 1959/60 was back to about 5 per cent. below the low pre-war level. The production especially of basic food crops appears to have lagged behind the growth of the population. Although these data take no account of changes in imports and exports, trends in actual food consumption levels, however, have probably not been very different from those in *per capita* production.

These are only rough indications, but they are all that exist. The trends that they suggest are all the more serious in that a reduction in supplies tends to be unevenly distributed over the different socio-economic groups and even within the family. The diets of women and young children are particularly inadequate, partly because of various food taboos, and their insufficient intakes of animal protein lead to deficiency diseases such as kwashiorkor in children aged from one to four.

and territories account for a much larger part of the total trade deficit of Africa than it would be expected from the role they play in African trade. Their relative share in total African trade in 1959, for instance, did not reach 30 per cent; but their balance of trade deficit was responsible for approximately two-thirds of the overall African gap. On the other hand, it will be seen that the improvement in the balance of trade of the sterling group accounted for 90 per cent of the reduction in Africa's total deficit between 1958 and 1959. The devaluation of the French franc at the end of 1958 makes it difficult to follow the dynamics of the Franc Zone exports in dollar terms; but, even allowing amply for the effect of that devaluation it seems clear that the volume of exports of the group in 1959 was not above the 1958 level.

TABLE A/II. 2.—AFRICAN TRADE BY CURRENCY AREAS
(in millions of U.S. dollars)

	1957	1958	1959
Total			
Exports	5,700	5,570	5,810
Imports	7,530	7,560	7,190
Balance	−1,830	−1,990	−1,380
Sterling Area			
Exports	2,620	2,500	2,840
Imports	3,400	3,360	3,240
Balance	−780	−860	−400
Franc Zone[1]			
Exports	1,507	1,654	1,411
Imports	2,443	2,554	2,323
Balance	−936	−900	−912
Other Countries			
Exports	1,573	1,416	1,558
Imports	1,687	1,646	1,558
Balance	−114	−230	−69

Source: Derived from *UN Monthly Bulletin of Statistics*, November 1960.

1 Excluding the French Somali Coast, the Comores and Reunion; including Guinea.

Another grouping, on a sub-regional basis, would show that North Africa as a whole did not benefit at all by the revival in demand for primary commodities in 1959. Contrary to the upward movement of total African exports, North Africa experienced a decline in the value of exports between 1958 and 1959. On the other hand, the West African group recorded only a slight improvement, which shows clearly that the bulk of the increase in total African exports is to be attributed to the expansion of the remaining group.

TABLE A/II. 3.—AFRICAN TRADE BY SUB-REGIONS
(in millions of U.S. dollars)

	North Africa[1]		West Africa[2]		South and East Africa	
	Exports	Imports	Exports	Imports	Exports	Imports
1957	1,663	2,532	1,206	1,505	2,831	3,493
1958	1,657	2,729	1,348	1,535	2,565	3,296
1959	1,558	2,628	1,387	1,530	2,865	3,032

Source: Derived from *UN Monthly Bulletin of Statistics*, November 1960.

1 Morocco, Tunisia, Libya, Algeria, UAR (Egypt), Sudan.

2 Former French West African countries, former French Equatorial Africa, Cameroon, Togo, Liberia, Ghana, Nigeria, Sierra Leone, Gambia.

A grouping on the basis of the export patterns of individual African countries would show that, as in the case of primary producing countries in general, African exporters of raw materials fared considerably better in 1959 than countries and territories which belong to the predominantly food exporting group. The impressive increase in exports from the Congo (Leopoldville), Sudan and the Federation of Rhodesia and Nyasaland, compared with the fall in exports from Algeria, Tunisia and Morocco may be mentioned as a convenient illustration. However, increased quantities of the products exported enabled a number of predominantly food exporting countries to achieve substantial increase by value in their exports, while in a few cases at least certain exceptional circumstances played an important role in determining the 1959 export levels. The following table, therefore, does not follow the export pattern criterion but simply lists the countries and territories covered in decreasing order of percentage change in the value of their exports between 1958 and 1959.

Out of the 22 countries and territories listed below, 14 recorded increases in their export value while the remaining eight were on the declining side. However, it should also be noted that six out of the 14 countries and territories in the first group had lower import levels than in 1958 and that only three of them—Nigeria, former French Equatorial Africa and Ethiopia—achieved an improvement in their balance-of-trade position at considerably higher levels of both exports and imports.

TABLE A/II. 4.—PERCENTAGE CHANGES IN THE TRADE OF SELECTED AFRICAN COUNTRIES AND TERRITORIES BETWEEN 1958 AND 1959[1]

	Exports	Imports
Sudan[2]	+53·8	4·0
Rhodesia and Nyasaland	+37·7	4·7
Togo[3]	+37·7	0·6
Guinea[4]	+33·7	+0·3
Congo and Ruanda-Urundi	+21·0	14·4
Nigeria	+20·6	+7·5
Former French Equatorial Africa	+12·8	+6·3
Cameroon	+10·1	10·2
Union of South Africa	+9·6	12·0
Ethiopia[5]	+9·6	+5·6
Ghana	+8·7	+33·6
Ivory Coast	+7·4	+23·8
Kenya, Uganda, Tanganyika	+4·1	+0·05
Mauritius	+0·2	4·1
Dahomey, Niger[4]	26·6	12·0
Algeria	12·0	+17·6
Malagasy Republic	7·9	+11·1
Tunisia	7·5	1·1
UAR (Egypt)	5·8	6·9
Angola	2·7	+0·9
Senegal, Mali,[6] Mauritania	0·6	+0·6
Morocco	0·5	13·6

Source: *UN Monthly Bulletin of Statistics*, October 1960, unless otherwise specified.

1 Based on values expressed in national currencies.

2 *Republic of the Sudan, Foreign Trade and Internal Statistics.*

3 *Togo* 1960, *Faits et Chiffres.*

4 *Banque centrale des Etats de l'Afrique de l'ouest, Notes d'information et statistiques*, May 1960.

5 *State Bank of Ethiopia, Report on Economic Conditions and Market Trends*, September 1960.

6 *Bulletin Mensuel Statistique et Economique, Federation du Mali*, April 1960.

The following table shows that out of the 22 countries and territories covered, 14 improved their trade balances in 1959 while the remaining eight recorded larger deficits than in 1958. However, as already stated, only in a very few instances did the smaller deficits reflects a real improvement in the trade position of the countries and territories in question, i.e. a higher degree of equilibrium at a higher trade level. From a comparison of the table below with the preceding one it will be readily seen that in the case of Morocco and the U.A.R. (Egypt) the improved balance-of-trade position in 1959 was due simply to the fact that these countries' imports suffered bigger reductions than their exports.

TABLE A/II. 5.—EXPORTS OF SELECTED AFRICAN COUNTRIES AND TERRITORIES EXPRESSED AS A PERCENTAGE OF THEIR IMPORTS

	1958	1959
Sudan	73	117
Rhodesia and Nyasaland	86 (90)	125 (129)
Congo and Ruanda-Urundi	112 (116)	159 (162)
Togo	84	116
Union of South Africa	70 (110)	88 (139)
Cameroon	108	132
Guinea	37	48
Morocco	86	99
Nigeria	81	90
Mauritius	91	98
Former French Equatorial Africa	67	71
Ethiopia	77	80
Kenya, Uganda, Tanganyika	101 (102)	105 (105)
UAR (Egypt)	71	72
Ivory Coast	156	115
Ghana	111 (124)	91 (101)
Algeria	43	32
Malagasy Republic	76	63
Dahomey, Niger	106	96
Tunisia	99	93
Mali, Senegal, Mauritania	66	65
Angola	98	95

Source: As Table A/II. 4.
Note: figures in brackets include exports of gold.

It is also obvious that the impressive improvements in the trade balances of the Sudan, Congo and Ruanda-Urundi, Union of South Africa, Cameroon and the Federation of Rhodesia and Nyasaland were not the result exclusively of the remarkable increases in their exports but also partly of substantial declines in their imports. For countries whose economic development depends heavily on imported goods balance-of-trade improvements so achieved cannot be regarded simply as a change for the better—especially when in most cases the decline in imports disproportionately affected imports of capital goods. This point will be discussed in more detail in the section dealing with African imports.

A few words should also be devoted to the geographical distribution of African trade, although—with the exception of Guinea—no spectacular changes in this field were recorded between 1958 and 1959.

The bulk of African trade is still conducted with present or former metropolitan countries, which means that, although slight shifts have been taking place in the distribution of African exports and imports, western Europe continues to dominate trade in African countries. However, in the last few years, and in particular between 1958 and 1959, the six members of the European Economic Community have gained some ground at the expense of other West-European countries, particularly the United Kingdom. It is worthwhile mentioning, for instance, that the E.E.C. group of countries bought 38 per cent of Ghana's total exports in 1959, compared with 33 per cent in 1958. A similar shift took place in the trade of Nigeria. The share of E.E.C. in that country's total exports increased from 31 per cent in 1958 to 34 per cent. in 1959. A rising trend in the relative share of the E.E.C. can also be observed in the exports of the Federation of Rhodesia and Nyasaland—from 16.2 per cent. in 1957 to 17 per cent. in 1958 and 21.2 per cent. in 1959.

With the exception of the U.A.R. (Egypt) and more recently Guinea—of which more will be said in the following sections—trade with the U.S.S.R. and Eastern Europe remained small and does not appear to be undergoing spectacular changes. However, as indicated by the rising number of trade agreements concluded between these countries and African countries, trade with the U.S.S.R. and Eastern Europe is likely to become more important for Africa.

TABLE A/II. 6.—TRADE AGREEMENTS SIGNED BY AFRICAN COUNTRIES AND TERRITORIES

Year	West-European countries	U.S.S.R., Eastern Europe, China	Asia and the Far East	Other African Countries
1957	5	2	—	—
1958	7	4	1	—
1959	13	24	4	4
1960 (Jan.-Sept.)	3	2	2	—

Source: *Board of Trade Journal*, January to October, 1960. *GATT—International Trade News Bulletin*, Vol. 9, 1959.

The relative position of trade with the United States and Canada does not seem to have undergone any significant change over the last two years. This trade is rather important for a large number of African countries, although the structural changes in the production and exports of western Europe, as well as the re-introduction of convertibility, may have somewhat reduced the earlier attractiveness of the North American market.

Japan's re-entry into African import trade in the last few years has been particularly important in the field of textiles; but there are indications that Japan is now preparing to enter the capital equipment and investment fields as well. In 1959, however, Japan's relative share in the total imports of a number of African countries was roughly the same or somewhat below the 1958 level, while its relative share in exports disclosed a slight rising tendency.

There was apparently a small increse in trade among African countries between 1958 and 1959; but this trade remains very low and probably does not amount to more than 10 per cent of their total recorded trade. However intra-African trade is of a considerable importance for a few countries and territories. Thus, for instance exports from the Union of South Africa to the rest of the region amounted in 1959 to more than 22 per cent of that country's total exports, while the share of imports from Africa—mostly from the Union—in the total imports of the Federation of Rhodesia and Nyasaland reached 37.5 per cent. The most serious obstacles to the development of intra-African trade arise from proliferation of economic frontiers and even more from serious lack of adequate intra-continental communications and transportation,[1] together with the low level of industrialisation characteristic of most of the continent. There can be no doubt, however, that there are excellent prospects for expanding intra-African trade in line with the economic development of African countries, increasing mutual contacts and a growing awareness of common interests and objectives.

African Exports

Major Changes between 1958 and 1959

Inasmuch as Africa's exports of primary commodities are largely dependent on the markets of the industrial countries, it is not surprising that they are closely

[1] See E/CN.14/63, **Transport Problems in Relation to Economic Development in West Africa**, paragraphs 27-41.

affected by changes in economic activity in these countries. A 10 per cent increase in world industrial production between 1958 and 1959 was followed by an increase of similar magnitude in the volume of African exports. This was the biggest spurt in a single year since the Korean boom and in terms of volume exports in 1959 reached an all-time high, being 84 per cent higher than pre-war and almost 50 per cent above the level in the early fifties. The upward swing has been continuing during 1960.

The increase in volume, as stated earlier, has not resulted in a corresponding increase in foreign exchange earnings, as the prices of African exports taken together fell by three per cent in 1958 and by a further five per cent in 1959. As a result, while the volume of exports in 1957 and 1958 was the same, total foreign exchange earnings of African countries in the latter year were nearly two per cent less. The average unit value of African exports during 1959 was the lowest since the 1949-50 recession, so that in spite of an increase of over 10 per cent in volume since 1957 the increase in value was less than half of that amount. As the value figures are computed in U.S. dollars, allowance should be made for the impact of devaluation in the "Franc zone" countries. The bulk of the trade of these countries being with France and other countries within the Franc Zone, devaluation did not seriously impair the real value of their export earnings. The **dollar value** of exports from these countries, accounting for a quarter of current African exports, fell in 1959 by over 11 per cent as compared with 1958 and by nearly four per cent as compared with 1957. In terms of their national currencies the fall is much smaller, some countries (Togo, Guinea, former French Equatorial Africa, Cameroon, Ivory Coast) actually show an increase in 1959 over 1958.[2]

Being mainly determined by conditions prevailing in various commodity markets, the external position of individual African countries in 1959 varied widely according to their respective export patterns. Countries with a large component of raw materials in their exports were generally able not only to achieve significant increases in the volume of their exports but also to gain through an improvement in their export unit values. On the other hand, with few exceptions only, the predominantly food-exporting countries were either, like Algeria, unable to maintain their 1958 levels of export proceeds or, if, like for instance Ghana, they succeeded in expanding the value of their exports, the advance was due to a more than proportionate rise in the quantity of products exported. In countries which have a multi-commodity export economy, e.g. Nigeria, the increase in the total value of exports was mainly due to high demand for their raw materials, although some food products also showed an appreciable rise. Prices of minerals in general were depressed, but metal ores, particularly copper, zinc and tin recorded appreciable gains, giving a sharp fillip to the exports of Congo (Leopoldville) and of the Federation of Rhodesia and Nyasaland.

However, there were some exceptions to this general pattern. The U.A.R. (Egypt), more than 70 per cent of whose exports consist of a single raw material, recorded a substantial drop in 1959. On the other hand, owing to certain special circumstances, countries like Guinea and the Togo Republic which, in the main, belong to the predominantly food-exporting group, were able to achieve unusually high increases in the value of their exports. Major developments in the exports of a number of African countries and territories are outlined in a subsequent section.

[2] See Table A/II. 4.

Commodity Pattern

African exports in general are dominated by agricultural products, which account for the great bulk of the export trade of most African countries and territories. The three main exceptions are Congo (Leopoldville), the Federation of Rhodesia and Nyasaland and the Union of South Africa—all of which have a large component of mineral exports.

Taking Africa as a whole agricultural products account for nearly two-thirds of the total value of exports excluding gold. Minerals, including metals and metallic ores other than gold, come next with a share of over 20 per cent. The remainder of the exports comprise fish, timber, miscellaneous primary products (like gum Arabic in Sudan) and a small amount of manufactured articles like cotton textiles, leather goods and lately aluminium (from Cameroon). Gold exports which are currently running at an all-time peak amount to over 12 per cent of the total value of all other exports.

TABLE A/II. 8.—AFRICAN EXPORTS OF AGRICULTURAL PRODUCTS INDEX NUMBERS, 1953-55. AVERAGE=100

	Volume (gross exports)			Value			Unit Value		
	1957	1958	1959	1957	1958	1959	1957	1958	1959
All agricultural products ..	113	115	123	108	110	106	95	95	86
Grains ..	119	147	75	96	111	59	78	74	78
Vegetable oils and oil-seeds (edible) ..	111	125	126	113	114	117	103	91	93
Beverages and tobacco ..	125	114	129	105	117	108	84	102	83
Agricultural raw materials	97	103	125	104	92	104	107	89	84

Source: *F.A.O.*; "*Review of the Food and Agricultural Situation in Africa*": *E/CN.*14/62.

In 1958 there was a sharp decline in the prices of most agricultural products, especially cotton and other raw materials; but the equally steep rise in cocoa prices offset losses in other sections so that the average export unit value for total African exports of agricultural commodities was maintained at the same level in 1958 as in 1957. In 1959, however, cocoa prices joined the general downward movement and the average unit value for agricultural exports as a group dropped by almost nine per cent. As a result, total agricultural export earnings fell by over three per cent in spite of a substantial rise in the volume of exports.

The beverages and tobacco group (coffee, cocoa, tea, wine and tobacco) is the most important in the agricultural export trade of Africa, and accounts for about 40 per cent of the total value of its agricultural exports.

The disproportionately heavy fall in the average unit value of this group in 1959 is accounted for by a deterioration in prices of cocoa, coffee and wine.

Agricultural raw materials are the second most important commodity group, representing nearly 30 per cent of the total value of agricultural exports. Most of the items in this group, particularly cotton, sisal, rubber and to some extent wool, fared better during 1959 than other commodity groups. Prices of all these products were severely affected in 1957 and 1958 by the recession in the industrialised countries, but most of them showed some signs of recovery in late 1959 and early 1960. The total value of exports of this group increased by a little over 12 per cent. in 1959 as compared with 1958.

Vegetable oils and oil-seeds account for a further 20 per cent of the total value of agricultural exports. The volume of exports in this group was slightly above the 1958 level, and owing to a slight improvement in the average export price the value of exports was also higher by just under three per cent. It is interesting to note that in some countries, especially Senegal and Nigeria, an increasingly large proportion of all groundnut exports is in the form of oil.

Grains and fruit, the remaining commodity group, play a relatively small part in the agricultural exports of Africa as a whole, but are of considerable importance in several individual countries, particularly North Africa. Exports of food grains declined sharply in volume in 1959 and despite a slight improvement in prices the total value of exports in 1959 was about half the 1958 level.

Gold, diamonds, non-ferrous metals and metal ores and minerals like phosphates and bauxite play an important role in the export pattern of a few African countries and territories, particularly Congo (Leopoldville), the Federation of Rhodesia and Nyasaland and the Union of South Africa. A considerable portion of the rise in the value of African exports in 1959 was contributed by increases in these items. Non-ferrous metals, particularly copper, showed a considerable price recovery in 1959 and, with some improvements in volume, pushed up the total value of exports by a substantial margin.

TABLE A/II. 9.—AFRICAN EXPORTS OF SELECTED MINERALS[1] INDEX NUMBERS: 1952–55=100

	Quantum			Value		
	1957	1958	1959	1957	1958	1959
Gold	—	—	—	130	130	150
Copper	114	114	139	96	76	116
Phosphates	110	124	133	109	124	133
Diamonds	—	—	—	160	160	180
Zinc ore	98	100	101	162	116	139
Asbestos	132	122	127	170	156	159
Tin ore	107	66	68	98	63	69
Cobalt	97	72	96	87	67	87

[1] Based on exports of major exporting countries.

Table A/II. 9 shows movements in the quantum and value of exports of 9 major items in this group between 1957 and 1959. In contrast to the general deterioration in 1958, all the items listed recorded increases, varying from one to over 30 per cent, in volume in 1959 over the preceding year. As a result of a parallel rise in world prices of copper, zinc and tin ores, the increases in value were of a higher magnitude, varying from two to over 50 per cent.

Though manufacturing plays a significant role in the gross domestic product of some African countries and territories,[3] particularly the Union of South Africa, Morocco, the U.A.R. (Egypt), Congo (Leopoldville), British East Africa and the Federation of Rhodesia and Nyasaland, the share of manufactured articles in the export trade of these countries, with the exception of the Union of South Africa, is still extremely small. Exports of processed goods (e.g. refined metals and oils) are, however, of real or potential importance to all of these and other African countries and territories.

Exports by sub-regions and countries

North Africa

The countries of North Africa can be roughly divided into two sub-groups: (1) the U.A.R. (Egypt) and the Sudan, which depend largely on exports of a single commodity, cotton, though some measure of diversification may be said to be emerging through the development of textile manufactures in the former and sizeable exports of gum Arabic and oil-seeds from the latter, and (2) Algeria, Morocco, Tunisia and perhaps also Libya, whose export trade is characterised by a relative preponderance of food items like wine, food grains, citrus fruits, fish, fresh vegetables and olive oil, but which also export significant quantities of minerals and metallic ores, particularly phosphates. Minerals and metallic ores constitute a large percentage of the total exports of Morocco and Tunisia. In years to come both Algeria and Libya are expected to export increasing quantities of crude petroleum.

Except for Sudan, all countries in this region suffered a decline of varying magnitude in value of exports from 1958 to 1959. The spectacular rise in the value of exports of the **Republic of the Sudan** was entirely due to a favourable cotton crop, which, together with substantial carry-overs from the preceding year, was readily absorbed by overseas markets. Production, which had fallen sharply in the preceding year owing to adverse climatic conditions and insect and disease infestations, recovered substantially in 1958-59 and was only seven per cent below the peak production in 1956-57. Mention may also be made of the new sales policy introduced in January 1959, which helped to make Sudanese cotton more competitive with that of other growers. The demand for Sudanese cotton was still high in the first half of 1960, but the 1959 cotton crop had been disposed of more rapidly than usual. As a result, total exports of cotton in the first quarter of 1960 amounted to a bare 9,200 metric tons as against 27,200 metric tons in the corresponding period in the previous year. In the latter part of 1960 cotton was believed to be less buoyant and sales of the current crop were not so rapid. The total value of exports, which had shown a decline in the first quarter, seemed, however, to be picking up, and the fall in the total

[3] See Table A/II. 13.

TABLE A/II. 10.—INDEX NUMBERS OF VALUE OF EXPORTS OF MAJOR AFRICAN COUNTRIES AND TERRITORIES AND THEIR SHARE IN TOTAL AFRICAN EXPORTS[1]

	Index Numbers 1953–55=100				Per cent of Total African Exports	
	1956	1957	1958	1959	1953–55 (average)	1959
AFRICA, total[2]	112	114	111	117	100	100
North Africa						
Algeria	102	110	116	87	8	6
Morocco[3]	115	108	117	112	6	5
Sudan	148	114	96	148	3	3
Tunisia	98	126	134	125	2	2
U.A.R. (Egypt)[4]	99	119	114	107	8	7
West Africa						
Cameroon	87	94	123	126	2	2
Former French Equatorial Africa	116	121	138	132	1	2
Former French West Africa[5]	114	109	119	99	6	5
Ghana	87	90	104	113	5	5
Nigeria	100	94	100	121	7	8
South and East Africa						
Angola	106	108	119	115	2	2
Congo and Ruanda Urundi	128	113	97	117	8	8
Ethiopia[6]	92	117	88	106	1	1
Kenya, Uganda and Tanganyika	120	119	123	128	5	6
Malagasy Republic	108	100	112	88	2	1
Mozambique	96	118	129	133	1	1
Rhodesia and Nyasaland	119	102	89	122	8	9
Union of South Africa[7]	124	136	118	129	18	20

1 Based on values expressed in current U.S. dollars. Re-exports are generally included. Exports of gold and gold coin are excluded throughout.
2 Includes countries and territories not listed separately.
3 Prior to 1958, Former French zone only.
4 Beginning 1958, excluding exports to Syria.
5 Including Guinea throughout.
6 Annual figures: 12 months ending September 10 of the year stated.
7 Including South West Africa.
Source: Based on data derived from the *UN Monthly Bulletin of Statistics*.

foreign exchange earnings in 1960 may not be unduly heavy.

As already mentioned, the **U.A.R. (Egypt)** was somewhat of an exception within the group of countries exporting mainly raw materials. The decline in Egyptian exports in 1959 contrasts sharply with the favourable developments in the Sudan although the export patterns of the two countries are very similar. The decrease in the value of exports of U.A.R. (Egypt) is mainly attributable to a poor rice crop, which was not offset by the small increase in the value of cotton exports. The relative share of rice in total Egyptian exports dropped from almost nine per cent in 1958 to less than one per cent in 1959. However, there was a considerable improvement in the export position in the first half of 1960. As a result of increased exports of cotton and other items, particularly textile manufactures, the total exports during this period were valued at £E.112 million, representing an increase of 36 per cent. over the figures for the first half of the previous year. The improvement in the cotton exports was due to a revival in demand and to a reduction in the size of crops in other producing areas caused by generally unfavourable weather conditions. There was a marked increase in exports of processed cotton, both of cotton yarn as well as cotton piece-goods, which partly reflects the serious efforts being made by the Government to diversify the country's export pattern.

Of all major countries and territories in Africa, **Algeria** suffered the worst decline in total value of exports in 1959, from 205 billion francs in 1958 to 181 billion francs. Most of this decline by far is to be attributed to the sharp drop in prices of wine from the exceptionally high 1957-58 level; but most agricultural exports also recorded smaller figures than in the preceding year. From 113 billion francs in 1958, wine exports fell to 90 billion in 1959, the relative share of wine in total Algerian exports falling from over 54 per cent to a little under 50 per cent. Citrus fruit and fresh vegetables, which together accounted for nearly 14 per cent of total exports in 1958, also registered a fall from 28 billion francs to well below 25 billion francs. Crude minerals and fuels improved from 20 billion to 23 billion francs, partly because of an increase in exports of crude petroleum from a little below 7 billion to well over 8 billion francs. The outlook for 1960 was buoyant, mainly owing to a general increase in the production of minerals and expanding production and exports of petroleum. The total value of exports in the first six months of 1960 was four per cent higher than in the corresponding period in 1959.

The drop in the prices of wine was also among the main causes of the decline in the value of exports from **Tunisia** in 1959—the first since 1955. While the quantity of wine exported decreased only insignificantly, the fall in value amounted to more than 43 per cent (from 13.1 million dinars in 1958 to 7.4 million dinars in 1959), bringing down the relative share of that product from 20 to 12.5 per cent. The fall in the value of wine exports was offset by a substantial rise in olive oil exports (from nine to 15 million dinars). Since, however, some other exports—like phosphates and fertilisers, iron ores, cereals, fruits and vegetables—also suffered minor reductions, the total value of exports was seven per cent below the figure for 1958. The average export unit value which reached its peak in 1958, declined by more than 14 per cent, bringing about a deterioration in the terms of trade of Tunisia, although there was also a substantial decline in the import unit value between 1958 and 1959. The downward swing in exports continued through the first half of 1960. Against 34.4 million dinars in the first half of 1959, exports in the first half of 1960 totalled 29.7 million, owing mainly to the poor olive harvest in 1959. However, as a result of an increase in mineral production, exports of iron ore increased from 340,000 tons to 590,000 tons. There was also a substantial increase in wheat exports.

The small decline in the value of exports from **Morocco** (from 1,451 million dirham in 1958 to 1,444 million in 1959) was accompanied by a rise in volume of at least six per cent. Food and beverages, which accounted for 46 per cent of the total value of exports, were the main cause of the divergent movements of exports in terms of volume and value. While the volume of this group recorded an advance of about nine per cent, its value went down by three per cent. Exports of raw materials increased in both volume and value, but the rise in value lagged somewhat behind that in volume. Under the stimulus provided by a 20.44 per cent devaluation of the Moroccan currency in October, 1959, exports in the first half of 1960 (in terms of national currency) were 28 per cent higher than in the corresponding period in 1959.

West Africa

West Africa as defined for this review comprises the

eight countries of former French West Africa, four countries of former French Equatorial Africa, Gambia, Sierra Leone, Liberia, Ghana, Togo, Nigeria and Cameroon. The major exports of this region include cocoa, coffee, groundnuts and oil, palm kernels and oil, timber, raw cotton, bananas, natural rubber, gold, diamonds and small quantities of other minerals like petroleum, iron ore, bauxite, manganese and tin ore. The former French territories are still closely linked with the French market, in which they enjoy special treatment and in which, in the case of most products, they get prices well above those prevailing in the world markets.

Ghana, Nigeria and Liberia recorded substantial gains in the value of exports in 1959 over 1958, while changes in countries which formerly belonged to the French Community were not altogether uniform. Guinea and Togo register exceptionally high increases while the combined exports of Dahomey and Niger suffered a heavy decline.

Ghana, which belongs to the predominantly food-exporting group—with her economy depending largely on cocoa—recorded the second highest value of exports in her history. The 1959 level was only surpassed by that of 1954, when cocoa prices were at an all-time high. However, the apparent success of the Ghanaian economy was exclusively the result of a large increase in exports in quantum terms, which was not accompanied by a corresponding rise in export proceeds. While the export volume index increased by almost 20 per cent—as a consequence of the 26.8 per cent rise in the volume of cocoa exported—the increase in value did not reach half that figure, owing to a 9.4 per cent fall in the export unit value. Exports in the first half of 1960 were well ahead of the corresponding figure in 1959.

Nigeria was among the few African countries which improved their balance-of-trade position with higher levels of both exports and imports. The multi-commodity export economy benefited largely from a high demand for most raw materials, like groundnuts, rubber, palm kernels, timber, and some minerals; but an increase in value of about 43 per cent was recorded in the exports of cocoa despite the drop in cocoa prices. The value of Nigerian exports during the first quarter of 1960 was £43.9 million, as compared with £48.6 million in the same period last year. The decline was accounted for by a marked drop in the volume and value of exports of cocoa beans, which fell to 42,000 tons, worth £9.6 milllion, as compared with 58,000 tons worth £16.4 million during the corresponding period of the previous year. However, higher shipments due to a record crop and better prices, in later months might have helped to offset the early falls. Exports of rubber and tin are also expected to register substantial gains over 1959.

The large expansion in the value of exports of the **Togo Republic** was achieved through increased shipments of coffee and cocoa, some of which represented clandestine exports from Ghana. Following an unusually rich crop—which is not repeated in 1960—the quantity of coffee exported more than doubled, so that the relative share of coffee in the total value of exports jumped from 24 per cent in 1958 to 41 per cent in 1959. With all of this increase being absorbed by the French market—on which prices for coffee from the Franc Zone remained unchanged—Togolese exports of coffee fared better than those of some other African countries, which had to compete in declining world markets. In contrast to the developments in Togolese exports, exports of coffee from the **Ivory Coast** suffered a decline in volume of 7 per cent and in value of about 15 per cent. This was primarily due to a sharp fall in the production and export of higher grades of coffee in 1958-9. The value of exports of bananas also fell by 16 per cent in comparison with 1958, even though there was a marked increase of 17 per cent in volume. The seven per cent rise in total exports between 1958 and 1959 was thus almost entirely the result of an increase of 65 and 21 per cent respectively in the value of cocoa and timber exported. In the first four months of 1960, however, the total exports of the Ivory Coast Republic were somewhat lower than in the corresponding period of the preceding year, with both cocoa and coffee on the declining side.

The combined exports of **Senegal, Mali and Mauritania** remained virtually unchanged between 1958 and 1959. As in the earlier years groundnuts and groundnut oil accounted for more than 82 per cent of total exports, which were absorbed up to 91 per cent by France. There was, however, a slight shift in favour of oil exports, accompanied by corresponding decline in the exports of groundnuts as such. This reflects the relative priority given to the local crushing industry in years of comparatively low output of groundnuts. The exports of the two remaining members of the West African customs union, Dahomey and Niger, recorded a drop of 26.6 per cent.

Guinea achieved a 33 per cent rise in the value of her exports in 1959 compared with the preceding year. Exports of coffee, which accounted for almost 32 per cent of total exports, rose by about 28 per cent in value; but the increase in the quantity of coffee exported was much larger (more than 40 per cent). By far the biggest increase was recorded in the exports of diamonds, which did not, however, reflect a corresponding increase in production but mainly a sharp drop in the traditional clandestine exports to neighbouring markets. The value of diamonds exported rose from 158 million francs in 1958 to 1,279 million, bringing the relative share of this mineral from 3.2 per cent in 1958 to 18.1 per cent in 1959.

In the regional distribution of Guinean trade, some important changes took place between 1958 and 1959; first, a sharp drop in trade with the seven members of the West African Customs Union (Senegal, Sudan, Mauritania, Ivory Coast, Upper-Volta, Dahomey, Niger) and, secondly, a decline in the part played by the Franc Zone in Guinean exports, while the relative shares of Belgian and the East-European countries rose substantially. Exports to the seven members of the Customs Union dropped from 441 million C.F.A. francs in 1958 to only 31 million.[4] The relative share of the Franc Zone fell from 75.8 per cent in 1958

[4] These figures do not include trade conducted by land.

to 51.4 per cent in 1959—most of the decline being concentrated on France. On the other hand, the relative share of other O.E.E.C. countries (excluding the United Kingdom) rose from 4.9 to 19.5 per cent, mainly as a result of a rise in diamonds exported to Belgium. The share of total exports going to East-European countries and China rose from 3.2 to almost 17 per cent.

South and East Africa

The countries of central, south and east Africa form two major distinct groups: (1) The Congo and Ruandi-Urundi, the Federation of Rhodesia and Nyasaland and the Union of South Africa, whose export earnings are largely derived from minerals and metals; and (2) Ethiopia, Angola, British East Africa and the Malagasy Republic, which draw substantially on their coffee production. However, agricultural commodities, like raw cotton, sisal, tea, oil-seeds, hides and skins, figure prominently in the exports of the countries of both groups. Of the remaining countries and territories, Somalia is dependent primarily on bananas, and Mauritius and Reunion on sugar, while exports of Mozambique are more diversified, including raw cotton, sugar, cashew nuts, copra, tea and sisal roughly in that order.

The **Federation of Rhodesia and Nyasaland,** whose exports declined both in 1957 and 1958 owing mainly to the weakening of copper in the world markets, achieved the second biggest expansion among the major African countries and territories in 1959. The average export unit value of the Federation in 1959 was still somewhat below the 1957 level; but a sizeable improvement was recorded between 1958 and 1959. The figures for the first six months of 1960 show a further improvement in the exports of the Federation, being valued at £64 million, as against £59 million in the first half of 1959. The exceptionally good tobacco and tea crops are likely to push up exports even further in the latter part of the year, though this gain may be partly offset by the sharp decline in copper prices on the world market.

The position of the **Congo (Leopoldville)** was in some respects similar to that of the Federation, although the increase in the value of Congolese exports was due not only to the improved position of copper and other minerals but also to an expansion in exports of agricultural products. The export unit value which had been steadily declining since 1955 went up by some six per cent. between 1958 and 1959.

The value of exports from the **Union of South Africa** in 1959, excluding gold, rose by almost 10 per cent over the 1958 figure. Gold, which accounts for over one-third of the total export earnings of the Union, registered an increase of 12.5 per cent. For the first seven months of 1960 the value of exports was running higher than during the corresponding period of 1959; but lately exports are believed to have been making less headway. The boycott of goods from South Africa may affect exports of some individual items. Canned fish, canned fruit and mining machinery are already being affected by boycotts introduced by Ghana and Malaya. The outlook for minerals is still reasonably good. Gold production continues rising to new record level and, along with diamonds, is helping to impart an element of buoyancy to the country's economy. As a result of the recent trade agreement with the Federation,[5] a substantial portion of the Union's exports to Rhodesia and Nyasaland might suffer a tariff disadvantage vis-a-vis similar products from the United Kingdom in that market. Wool prices have also been falling. As a net result of all these factors, it may be difficult to more than maintain the level of total exports during the rest of 1960.

With more than half her exports consisting of coffee, **Ethiopia** was among those countries which did not benefit from the 1959 expansion in industrial areas. The unit value of exports declined by seven per cent, owing to a fall in coffee prices; but as a result of a normal coffee crop—production in 1958 was much below the average due to a severe drought in the country—Ethiopia was able to export 22 per cent more by volume than in 1958. Coffee exports in the first half of 1960 are reported to have been higher than in the corresponding period of 1959, with prices showing some signs of recovery since May this year.

British East Africa experienced a modest increase of 4 per cent in value of exports, primarily accounted for by an improvement in exports of sisal and of hides and skins. The increase in these two main items were, however, partly offset by a decline in coffee and cotton exports. The total value of exports in the first six months was slightly above the corresponding figure for 1959. With an improvement in coffee and cotton exports, the year 1960 is likely to register a further increase in export earnings.

The decline in the value of exports from the **Malagasy Republic** was entirely due to the reduction in quantities exported following on crop failures caused by exceptionally bad weather. All the main products—like coffee, rice, maize and dried vegetables—recorded substantially lower exports in quantum terms than in the highly favourable preceding year. At this time of writing, prospects for the current year seemed still rather uncertain, since it has not yet been possible to obtain an accurate picture of the devastations caused by flood in the spring of 1959. Coffee, vanilla and some other agricultural products are likely to feel the consequences even in the current year, while, on the other hand, a larger crop and increased exports seem to be expected in rice.

Angola registered a decline of three per cent in value of exports from 1958 in spite of a five per cent increase in volume. This was again due primarily to the general depression in world coffee prices in 1959. Minerals (mainly diamonds and iron ore) registered substantial gains in both volume and value. Angola also benefited slightly from the rise in sisal prices during 1959. But the losses in coffee, which accounts for over 40 per cent of Angola's total value of exports, more than offset these fringe benefits. Coffee exports in the first five months of 1960 were still lower than the corresponding figures for 1959—a drop in volume of seven

[5] See Part B, Chapter I.

per cent, in value of 15 per cent. The short-fall in earnings from coffee during these five months (from 635.7 million escudos in Jan.-May, 1959 to 538.4 million escudos for the same period in 1960) was largely offset by sizeable gains recorded for sisal, iron ore, sugar and palm oil. The total value of exports in the first five months of 1960 was still 43 million escudos higher than the corresponding period in 1959.

Unlike Angola and many other countries, **Mozambique** experienced an improvement in export prices in 1959. This was due to high prices received for copra and sisal, while the fall in other prices were relatively small. Though volume of exports dropped in respect of most commodities exported (raw cotton, sugar, copra, cashew nuts and sisal) the total value of exports was still 3 per cent above the 1958 figure. Tea was the only major commodity exported which showed an increase in both value and volume in 1959 as compared with 1958. The outlook for 1960 was rather buoyant and the total value of exports in the first four months stood 35 per cent higher than in the corresponding months of the previous year.

African Imports

General Characteristics

Most African countries being in present circumstances committed to rapid economic development, the structure and growth of imports must play an important role in the strategy of that development. The implementation of development plans tends in fact to increase the import-propensity of African countries in both the public and the private sectors. This has involved many African countries in recurrent balance-of-payments difficulties which have only been contained by running down foreign exchange reserves. The tendency in these circumstances has often been for import restrictions and liberisation to see-saw in response to adverse and favourable balance-of-payments positions, with resultant interruptions to the rate of economic growth. The stringency with which any country has applied import controls and the extent to which these have been selective have been related to its capacity to import and to the stage and rate of economic development. Countries pledged to a policy of economic development but without adequate foreign exchange reserves have, on the whole, experienced a more marked shift towards imports of capital goods than have countries which could afford to increase their imports of both investment and consumer goods

In some cases balance-of-payments problems have been alleviated with the aid of foreign investments and foreign aid. However, neither foreign investments nor foreign aid can be expected to be forthcoming in a volume commensurate with the objectives of current development plans, while import controls, unless designed on a long-term basis and properly administered, may have an adverse effect on the maturation of the development plans themselves. Consequently if, the tendency towards high imports is not to frustrate the objectives of economic development, African countries need to pay more discriminating attention to the growth and, particularly, to the structure of their import packages. In present circumstances the exigencies of steady economic development would seem to suggest a more consistent long-term import policy geared to the needs of each country's development plan.

TABLE A/II. 11.—WORLD[1] AND AFRICAN IMPORTS
Index Numbers: 1953–55 (Average) = 100

Years	Value[2]		Quantum		Unit Value (Imports)	
	World	Africa	World	Africa	World	Africa
1956..	120	112	118	110	101	101
1957..	132	123	125	117	103	104
1958..	123	124	123	121	100	102
1959..	129	119	134	118	98	98

1 Excluding the trade of U.S.S.R., Eastern Europe, China and North Korea.
2 Based on values expressed in current U.S. dollars.
Source: *U.N. Monthly Bulletin of Statistics*, October 1960.

The upward trend in imports noticeable for most African countries since the beginning of the fifties has been generally maintained with few interruptions, and indications are that this trend will probably continue. The increase in African imports by one-half between 1950 and 1958, in quantum as well as in value terms, is in consonance with the general growth of international trade after the war, but in some countries the rate of expansion is perhaps more closely related to the vast investment projects started in the early fifties. It is interesting to note, however, that while total world imports registered an appreciable decline in 1958 as a result of the 1957-58 recession and then rose again in 1959, the impact of the world recession on African imports was not felt till the last quarter of 1958, owing essentially to the time lag between the decrease of export earnings and its repercussions an actual imports. As a result, the imports of African countries actually registered a slight increase in 1958 over 1957 and later fell during 1959. The recovery which began in the last quarter of 1959 appears to have gathered momentum during 1960 when imports for the whole year are expected to reach an all-time high.

Imports of individual African countries did not conform to this general pattern in all cases. Algeria, Angola, Ethiopia, Libya, Mozambique and Nigeria did not experience any setback to imports either in 1958 or in 1959. The uninterrupted rise in imports of these countries was partly associated with the stepping-up of oil prospecting operations and other investment activity. At the other end of the scale there were countries like Congo (Leopoldville), Rhodesia and Nyasaland, British East Africa, Sudan, Malagasy Republic, Morocco and Tunisia whose imports continued to fall through 1958 and 1959. This may have been due to a slowing down of investments resulting from political uncertainties regarding the future of the first three countries and territories, or to a deliberate restriction of imports following balance-of-payments difficulties, as in the case of Sudan and Tunisia. Ghana, alone among the African countries, followed the general world trend of a sharp decline in 1958 followed by an equally sharp recovery in 1959. This was associated with a cut in development expenditure in 1958 which was later restored for 1959 consequent on the decrease in export earnings in 1956-57 followed by an increase in 1958-59.

Commodity pattern of imports

While the level of African imports has risen since the early fifties, the commodity pattern has been undergoing

TABLE A/II. 12.—INDEX NUMBERS OF VALUE OF IMPORTS OF AFRICA AND MAJOR AFRICAN COUNTRIES AND TERRITORIES AND THEIR SHARE IN TOTAL AFRICAN IMPORTS[1]

	Index Numbers Average 1953–55 = 100				Per cent. of Total Africa Imports	
	1956	1957	1958	1959	1953–55 (average)	1959
AFRICA, Total[2]	112	123	124	119	100	100
North Africa						
Algeria	123	164	180	180	10	16
Libya	138	232	285	335	1	2
Morocco[3]	94	84	82	68	8	5
Sudan	92	137	120	116	2	2
Tunisia	112	99	89	88	3	2
U.A.R. (Egypt)[4] ..	105	107	130	121	8	9
West Africa						
Cameroon	103	107	111	89	2	1
Former French Equatorial Africa	123	148	147	134	2	2
Former French West Africa[5]	106	117	123	102	6	5
Ghana	115	125	109	146	4	4
Nigeria	128	128	140	150	6	7
South and East Africa						
Angola	121	135	143	144	2	2
Congo and Ruanda-Urundi	112	118	97	83	6	4
Ethiopia[4]	100	114	125	133	1	1
Kenya, Uganda, Tanganyika	108	113	98	98	6	5
Malagasy Republic ..	102	109	98	92	2	2
Mozambique	112	122	135	144	1	2
Rhodesia and Nyasaland	125	140	124	118	6	6
Union of South Africa[7]	110	123	124	109	21	19

1 Based on values expressed in current U.S. dollars.
2 Including countries not separately listed.
3 Prior to 1958 Former French Zone only.
4 Beginning 1958, excludes imports from Syria.
5 Includes Guinea throughout.
6 Annual figures: 12 months ending September 10 of the year stated.
7 Includes Basutoland, Bechuanaland, South West Africa and Swaziland, but excludes trade among them.
Source: Based on data derived from the *U.N. Monthly Bulletin of Statistics.*

considerable changes. Traditionally important imports like textiles, which held a preponderant place in the import package of most African countries, have been losing ground relatively to categories such as capital equipment, basic materials and mineral fuels. The decline in the share of textile imports is due partly to increasing domestic production in many African countries and partly to some diversion to cheaper sources of supply. Textile imports are likely to decline still further when current plans for the development and expansion of local textile manufacturing materialise.[6] Although food imports have lost some ground to other categories in some African countries, they are still very important in others, particularly the smaller countries. This will probably continue to be the case for a long time to come, since a rising middle class, together with the existence of large expatiate communities, creates a demand for quality foods which cannot be produced locally in the near future. Furthermore, food production in many African countries is at present not keeping pace with population growth and rising incomes.[7] This fact also reflects the increasing urban concentrations that are developing in many African countries.

Although Africa is an exporter of agricultural products, its imports of certain foodstuffs—wheat, flour, rice and tea—are quite substantial. Imports also include sugar, potatoes, some vegetable oils, prepared and canned meats, butter and cheese. With the exception of rice, gross and net imports of most of these commodities have increased rapidly. Imports of wheat and wheat flour into the continent in 1959 were nine times[8] as high as in the pre-war period. This, together with the substantial increases in imports of potatoes, prepared and canned meats and dairy products, is an indication of the changes in diets that are developing with urbanization and rising incomes. Wheat imports into South Africa rose sharply in 1959 following two years when, as a result of two successive bumper harvests, no imports had been recorded. But by far the largest importer of wheat and wheat flour on the continent is the Egyptian Region of the UAR, although these imports fluctuated sharply from year to year. The increase in the imports of temperate-zone foodstuffs is spread over most of the continent, although a significant part of imports of prepared meat goes to Ghana. Imports of sugar are very large and at present stand at 2½ times the pre-war figure. This very rapid increase is also a manifestation of urbanization and rising incomes, and is evenly distributed over the continent except where there is substantial local production of the commodity. Imports into Morocco, however, were exceptionally high—about 30 per cent in volume of the total imports of sugar into Africa.[9]

Except in the Union of South Africa, UAR (Egypt), Morocco, Tunisia, the Congo Republic (Leopoldville), the Federation of Rhodesia and Nyasaland and Kenya manufacturing in Africa is not so extensively or highly developed as to permit of any significant import substitution. However, given the higher productivity usually associated with it, manufacturing does contribute a not altogether insignificant part of the domestic product of some other African countries.

TABLE A/II. 13.—MANUFACTURING AS A PERCENTAGE OF GROSS DOMESTIC PRODUCT OF SIX AFRICAN COUNTRIES, 1955–58

	1955	1956	1957	1958
Union of South Africa	24	24	24	25
Morocco	15	15	17	16
Congo (Leopoldville)	10	12	13	13
Kenya	9	9	10	10
Federation of Rhodesia and Nyasaland ..	8	8	10	11
Tanganyika	6	6	7	7

Source: *U.N. Yearbook of National Accounts Statistics*, 1959.

Development plans in many African countries place great emphasis on industrialisation, and it is reasonable to suppose that when these plans materialise a number of African countries will be able to replace some imports by local manufacturers. Some commodities which are already produced locally in part substitution for imports are textiles, cigarettes, beverages (mainly beer and soft drinks), meat products, some dairy products, edible oils and fats, flour, footwear, some chemicals, cement and building materials. Apart from the Union of South Africa and the UAR (Egypt) which recently began production of automobiles—no African country produces machinery or transport equipment, although

[6] Projected production of textiles in Nigeria and Ghana alone will amount to 33 million yards of cloth annually. Ghana's share of 15 million yards will represent 25% of its present total imports. Ethiopia, U.A.R. (Egypt), Sudan and Morocco all have plans to establish or expand the production of textiles.

[7] "Review of Food and Agricultural Situation in Africa" (Doc. E/CN.14/62), p. 1.

[8] "Review of Food and Agricultural Situation in Africa" (Doc. E/CN.14/62).

[9] Virtually all these imports were of crude sugar. In terms of value Morocco's share in African imports of sugar is much less since most African countries import refined sugar.

in recent years the assembly of transport vehicles has become quite widespread.

TABLE A/II. 14.—INDEX NUMBER OF INDUSTRIAL PRODUCTION—1953 = 100

	1955	1956	1957	1958	1959
Algeria					
General[1] [2]	120	124	130	146	148
Manufacturing[1]	123	134	142	165	168
Congo (Leopoldville)					
General	126	140	151	140	138
Textiles	134	156	138	141	166
Ethiopia					
General[3]	100	105	117	121	130
Morocco					
General[4]	109	111	111	116	115
Manufacturing[4]	105	107	106	108	99
Tunisia					
Mining	120	113	110	114	104
U.A.R. (Egypt)					
Manufacturing[5]	117	125	132	143	149

1 Clothing and footwear, wood products, furniture, leather, rubber, petroleum and coal products are not included.

2 The extraction of crude petroleum and natural gas is not covered.

3 Excluding electricity; 1955 = 100.

4 Excluding buildings and public works.

5 Cotton ginning and pressing, clothing and wood, rubber and metal products are not covered.

Source: *U.N. Monthly Bulletin of Statistics.*

Imports by Sub-regions and countries

North African Countries

Although natural conditions make of North Africa a relatively homogeneous economic region, this is not reflected in similar import patterns mainly because of the widely varying levels of economic development. The only common characteristic in the structure of imports is the relatively high share (around 20 per cent) of food, beverages and tobacco. However it would seem that this high share is due, in some countries, more to the importance of sugar, coffee and tea imports than to that of staple foodstuffs, whereas in others the reverse is the case. As far as basic materials are concerned, their share varies from around 1 per cent in the less industrialized countries to more than 10 per cent in Egypt and more than 15 per cent in Morocco. A similar pattern exists in the case of mineral fuels and chemicals. The divergence is also very marked for textiles where the range is between 4 and 17 per cent, the extremes being Egypt and Sudan respectively. Finally the share of machinery and transport equipment exceeds 20 per cent in all countries with the exception of Sudan and Tunisia but, as will be seen later, the exceptionally high share recorded by Libya is exclusively due to oil prospecting and drilling.

The import patterns of the various countries are undergoing changes. The considerable variations in the food imports of several countries are linked to extreme fluctuations in domestic production; but there is an obvious trend, at least in UAR (Egypt) and Morocco, towards an increasing share of this group. Since import substitution in textile has temporarily reached its limit in several countries, no decreasing trend appears in this category. There was, however, a decline in UAR (Egypt)[10] and Sudan, where import restrictions probably played an important role. Finally, the investment slump followed by some recovery explains the wide movements in imports of machinery and transport equipment in Morocco and Tunisia, whereas the fluctuations in UAR (Egypt) may reflect the combined effect of import substitution and balance-of-payments difficulties.

In general, it can be said that the import patterns of North African countries are extremely sensitive to changes in economic and climatic conditions, and this fact is to some extent linked to the absence of foreign exchange reserves which imposes day-to-day adjustments of considerable magnitude.[11]

Imports into **Morocco** rose steadily in volume (except for a small decline in 1954) from 1950 to 1955, when they were about 50 per cent higher than the 1949 level. From 1956 imports began to decline and reached a low level in 1959. The greatest decline was experienced in imports of capital goods, which fell from a peak of U.S. Dollars 101.4 million in 1952 to Dollars 59.0 million in 1958. This drop was probably due to the fact that new foreign investments had almost ceased since 1956 while existing firms were slowing down their rate of investments. These developments together with some outflow of capital reflected political difficulties with France—the main source of foreign investments—after the independence of Morocco.

The share of imports of machinery and transport equipment in total imports declined considerably and in 1958 were only 19 per cent of total imports. (In 1955 these had represented 27 per cent of total imports). On the other hand, imports of consumer goods, including food products, have remained relatively high, although they have been declining slightly in absolute terms since 1955. Imports of food, beverages and tobacco, have been increasing since 1955, with the exception of a small drop in 1958. Textile imports are relatively small and did not exceed 8 per cent of total imports between 1955 and 1958. Imports of basic materials experienced the most rapid development over the period 1955/58, representing 19 per cent of total imports in 1958, as compared with 3 per cent in 1955.

TABLE A/II. 15.—MOROCCO: IMPORTS BY CATEGORY AS PERCENTAGE OF TOTAL VALUE, 1955–59[1]

Category	S.I.T.C. Section/Division[2]	1955	1956	1957	1958	1959
Food, beverages and tobacco	0, 1	19	19	28	25	—
Basic materials and mineral fuels	2, 3, 4	11	15	25	26	—
Chemicals	5	4	4	6	6	—
Textiles	65	6	8	6	7	—
Machinery and transport equipment	7	27	21	16	19	—
Other manufactures	6, 8	12	12	16	15	—
Miscellaneous	9	21	21	3	2	—
Total Imports (million U.S. dollars)	0–9	497	459	402	401	332

1 Based on values expressed in current U.S. dollars.

2 As published data are not based on S.I.T.C., classifications are approximate.

Sources: Based on data derived from *U.N. Yearbook of International Trade Statistics and national publications.*

The Moroccan economy was in a depressed state almost throughout the whole of 1959, although there seems to have been some revival during the first half of 1960. Imports of capital goods showed an increase in

[10] Which also exports textiles.

[11] This was a relatively new development for Morocco and Tunisia which could, until two years ago, rely on the mechanism of the "compte d'opérations" (see Part B, Chapter I).

the early part of 1960, and it is likely that current attempts at industrialization will stimulate imports.

Imports into **Tunisia** have failed to grow since 1957, when they dropped below the 1956 level. Total imports in 1956 amounted to US. Dollars 194 million; they fell to 172 million in 1957, 155 million in 1958, and 153 million in 1959. Imports of machinery and transport equipment represented a relatively modest share of total imports and developed rather slowly over the period 1956/59. In 1956 this catergory of imports was only 14 per cent of total imports. This share rose to 18 per cent in 1959. Food imports have constituted a high proportion of total imports since 1956 although they have followed a declining trend. The share of textile imports rose between 1956 and 1959 from 11 to 15 per cent.

The percentage share of basic materials and mineral fuels in total imports has been declining since 1956 but there was small rise in 1959. Total imports showed an increase in almost all items during first three months of 1960, particularly with respect to capital goods which rose from U.S. Dollars 3.8 million to Dollars 6.9 million during that period. In the year 1959 as a whole, these imports had fallen from the 1958 level of Dollars 22.6 million to Dollars 22.1 million.

TABLE A/II. 16.—TUNISIA: IMPORTS BY SELECTED CATEGORIES AS PERCENTAGE OF TOTAL VALUE, 1955–59[1]

Category	S.I.T.C. Section/ Division[2]	1955	1956	1957	1958	1959
Food, beverages and tobacco	0, 1	—	29	26	20	20
Basic materials and mineral Fuels ..	2, 3, 4	—	15	13	11	12
Textiles	65	—	11	14	14	15
Machinery and transport equipment	7	—	14	14	17	18
Total Imports (million U.S. dollars) ..	0–9	181	194	1–72	155	153

1 Based on values expressed in current U.S. dollars.

2 As data are not based on S.I.T.C., classifications are approximate.

Sources: Data derived from *U.N. Yearbook of International Trade Statistics and national trade publications.*

Of almost all the African countries, **Libya,** has experienced the most dramatic development of imports in recent years. With the continuing expansion of oil prospecting, imports in 1959 amounted to US Dollars 114 million as against 40 million in 1955. Imports of machinery and transport equipment have experienced the most spectacular growth, resulting from increasing activity in oil prospecting and drilling. Probably for the same reason imports from the United Kingdom were higher than those from Italy, which had until then been Libya's most important supplier. Imports from the UK totalled U.S. Dollars 24.6 million while those from Italy amounted to Dollar 24.4 million. Imports from the United States were also important, amounting to $23.5 million. The most notable feature of Libyan trade in 1959 was the emergence of Egypt as Libya's best customer. The UAR (Egypt) took $4.7 million ($2.0 million in 1958) of Libyan export against Italy's $3.2 million ($4.5 million in 1958). Indications are that Libyan imports are likely to continue their upward trend as long as the outlook for oil exploitation remains good and that machinery and transport equipment will continue to figure prominently in the import pattern.

TABLE A/II. 17.—LIBYA: IMPORTS BY CATEGORY AS PERCENTAGE OF TOTAL VALUE, 1955–59[1]

Category	S.I.T.C. Section/ Division	1955	1956	1957	1958	1959
Food, beverages and tobacco	0, 1	32	29	22	15	—
Basic materials and mineral fuels ..	2, 3, 4	14	12	10	7	—
Chemicals	5	5	6	6	8	—
Textiles	65	10	9	8	7	—
Machinery and transport equipment	7	15	18	30	38	—
Other manufactures	6, 8	24	26	24	25	—
Total Imports (million U.S. dollars) ..	0–9	40	47	79	97	114

1 Based on values expressed in current U.S. dollars.

Sources: Data derived from *U.N. Yearbook of International Trade Statistics and national publications.*

The striking feature of **Sudan's** foreign trade between 1956 and 1959 was the lagged response of imports to changes in the level of the country's exports in a situation characterised by the absence of sizeable foreign exchange reserves. A year of high exports—and consequently a favourable balance of trade—has generally been followed by a more liberal import policy and a resultant increase in imports in the following year and vice versa. The year 1956 was one of import restrictions, tightening of credit and considerable reductions in existing stocks of imported commodities. The end of that year saw a decline in the value of imports accompanied by a significant rise in the value of exports. A favourable balance ensued, import restrictions were relaxed and accordingly imports rose sharply in 1957 from U.S. $130 million to 194 million. Since exports also fell during the same period (from 192 million dollars to 148 million) import restrictions were reimposed in April 1958 and by the end of the year imports had declined appreciably; but the year still ended with a deficit.

TABLE A/II. 18.—SUDAN: IMPORTS BY CATEGORY AS PERCENTAGE OF TOTAL VALUE, 1955–59[1]

Category	S.I.T.C. Section/ Division[2]	1955	1956	1957	1958	1959
Food, beverages and tobacco	0, 1	27	27	25	19	25
Basic materials and mineral fuels ..	2, 3, 4	8	9	9	10	9
Chemicals	5	6	6	6	6	6
Textiles	65	18	19	17	13	18
Machinery and transport equipment	7	17	15	18	23	18
Other manufactures	6, 8	24	24	25	29	24
Total Imports (million U.S. dollars) ..	0–9	140	130	194	171	164

1 Based on values expressed in current U.S. dollars.

2 As published data are not based on S.I.T.C., classifications are approximate.

Sources: Data derived from *U.N. Yearbook of International Trade Statistics and national trade publications.*

Imports continued to decline slightly in 1959 and at the end of the year this movement, combined with increased receipts from exports, turned the previous deficit into a surplus. Once again the government's trade policy was altered, and import restrictions were relaxed in July 1959. The resultant influx of imported goods was so great that imports in the last quarter of 1959 were over 60 per cent higher than in the corresponding quarter of 1958. This trend continued through the first quarter of 1960, when the level of imports was again almost 60 per cent higher than for the same period in 1959.

The dependence of the Sudan on food imports and

other consumer goods is quite marked, and food imports remained at a high level from 1955 to 1959. Domestic production is limited and is unlikely to develop substantially enough in the near future to make possible any significant degree of import substitution, although there are marked efforts at economic diversification and manufacturing. Machinery imports developed relatively slowly at a level much below that of food imports —an average for the period 1955/59 of 18.3 per cent of total imports as against 24.2 per cent for food imports.

Imports into **UAR (Egypt)** grew at an annual rate of about 4.5 per cent from 1956 to 1958, but there was a drop of about 7 per cent in 1959. The most important increase was in wheat and flour imports, which rose from U.S. $23.3 million in 1956 to $85.6 million in 1959. Imports of producer goods also increased throughout the period, although at a less pronounced rate— from $302.4 million to $387.7 million, and slightly above this figure in 1959. In 1956 wheat and wheat flour represented a mere 4.3 per cent of total imports; by 1958 they had risen to 10.2 per cent and in 1959, together with maize, amounted to 14 per cent of total imports. The sharp rise in grain and flour imports was due partly to the increased consumption requirements of a growing population and partly to the displacement of some food crops by cotton in a situation in which the total areas under food crops did not increase. The share of food imports in total imports has increased steadily since 1955 although there was a drop in 1958 when they represented 21.7 per cent of total imports. As a result of increased domestic production, imports of crude oil and petroleum products fell from $88.7 million in 1958 to $61.5 million in 1959.

On the other hand, imports of capital goods increased slightly over the 1958 level. Estimates of the probable evolution of UAR imports indicate that they will continue to increase or, at any rate, to maintain their current levels. This is due to the fact that current development plans will generate a high degree of imports, and also to the fact that it will not be possible to replace the considerable imports of food and other consumer goods by domestic production until the full gestation of current investment projects.[12]

TABLE A/II. 19.—U.A.R. (EGYPT): IMPORTS BY CATEGORY AS PERCENTAGE OF TOTAL VALUE, 1955–59[1]

Category	S.I.T.C. Section/ Division	1955	1956	1957	1958	1959
Food, beverages and tobacco	0, 1	14	18	26	22	—
Basic materials and mineral fuels	2, 3, 4	20	21	25	22	—
Chemicals	5	12	10	14	14	—
Textiles	65	6	4	3	3	—
Machinery and transport equipment	7	25	24	15	23	—
Other manufactures	6, 8	22	22	16	15	—
Miscellaneous	9	1	1	1	1	—
Total Imports (million U.S. dollars)	0–9	538	535	547	662	616

1 Based on values expressed in current U.S. dollars.

Sources: Data derived from *U.N. Yearbook of International Trade Statistics and national trade publications.*

Remarkable shifts are noticeable in the geographical distribution of UAR (Egypt) trade after 1956, particularly with regard to the United Kingdom—an aftermath of the "Suez Crisis" of 1956 and political difficulties with the west European countries generally. The most dramatic change is the growing importance of eastern Europe, particularly the USSR—to the almost complete exclusion of the United Kingdom. In 1955 imports from eastern Europe amounted to only 6.5 per cent of total imports. In the following year this figure increased by nearly 100 per cent, reaching 12.3 per cent ($65.7 million). By the end of 1959 these imports stood at $159.7 million or 25 per cent of total imports, after reaching a peak of $194.4 million or 28.4 per cent in 1958. A similar significant development is noticeable for exports to eastern Europe and the USSR, which rose from $81.6 million (19.6 per cent) in 1955 to $194.1 million (44 per cent) in 1959.[13]

Most seriously affected by these shifts was the United Kingdon whose exports to the UAR (Egypt) fell from $63.0 million (12.0 per cent) in 1955 to $7.9 million or 1.5 per cent in 1957. Subsequently, there was a slight improvement and UAR (Egypt) imports from the UK rose to 7.3 per cent of total imports in 1959. Egyptian exports to the United Kingdom also fell sharply from 5.6 per cent of total exports in 1955 to 2.8 per cent in 1959. Trade with the EEC countries also declined sharply and imports from these countries regressed from 32.8 per cent to 14.7 per cent of total imports. Imports from the United States and Canada, which are substantial, recovered after a serious setback in 1954 and continued to grow, with some interruptions, until they stood at 14 per cent of total Egyptian imports in 1959 (2.4 per cent in 1952). Trade with African countries also experienced a decline and imports fell from 5.4 per cent of total imports ($29.1 million) in 1956 to 2.5 per cent in 1959. Similarly, exports to the rest of Africa declined from $32 million (8.0 per cent) in 1956 to $18.5 million (4.2 per cent) in 1959.

West African countries

During the whole post-war period the pattern of imports into most **West African** countries showed a remarkable similarity, due to almost identical structures of production and habits of consumption. Because of the quasi-absence of production of temperate-zone agricultural products the share of food, beverages and tobacco was consistently high, approaching or even exceeding 20 per cent of total imports. The relatively low level of industrial development was reflected in the small share of basic materials—nowhere exceeding 2 per cent. Mineral fuels and chemicals varied from 6 to 7 and from 4 to 7 per cent respectively, whereas textiles in general accounted for one-fifth of total imports. The share of machinery and transport equipment in total imports ranged from 15 to 25 per cent; this share was definitely lower in West Africa than in the more industrialized countries of Central and North Africa. It should be added that the commodity classifications used in West African trade statistics, as well as the varying shares of unrecorded trade, limit considerably the sig-

[12] **National Bank of Egypt, Economic Bulletin, Vol. XII, No. 3, 1959.**

[13] A considerable proportion of cotton exports to the U.S.S.R. was re-exported, and the U.A.R. has recently taken measures to prevent this recurring.

nificance of comparisons from one country to another. For instance the relatively low share of food in Nigerian imports can be attributed to the fact that livestock imports from the north are not included in trade statistics, whereas such imports are recorded in Ghana.

With these generally similar import patterns, some changes have occurred in the last few years affecting different countries in varying degrees. There was an almost general decrease in the share of textile imports in the trade of most of the countries of the area which, as stated earlier, was limited to domestic growing production although the decline or stagnation in the earnings of the producers of cash crops may also have had an effect on these imports. The increase in the imports of machinery and transport equipment was less noticeable; changes can be distinguished only in Nigeria, Ghana (in fact essentially in 1959) and Sierra Leone. Finally, in some countries the share of food in total imports has tended to increase; but, as mentioned above, the figures have to be interpreted with some caution.

In general, it is difficult to establish clear-cut trends in the import patterns of West African countries in relation to major structural changes. In fact some tendencies would emerge more clearly if the behaviour of individual items, as against groups of commodities, could be analysed.

Former French West African imports are difficult to deal with at the present time, since data are no longer available for the area as a whole and the new independent nations which emerged after the break-up of the former administrative unit have not yet begun to publish comparable data on the structure of their imports. The data which form the substance of this section are thus based on the reports of the **Banque Centrale des Etats de l'Afrique de l'Ouest** and may not contain all the latest information.

The evolution of former **French West African** imports has followed the general trend of imports into **West Africa.** Imports of machinery and transport equipment are growing faster than any other category, and the area also continues to show a marked dependence on food imports. In 1958 these two categories accounted for 19.9 and 23.2 per cent respectively of total imports. In 1959 they rose to 22.2 and 25.7 per cent respectively. Import of other consumer goods form a high proportion of imports (36.8 per cent in 1958, 32.7 per cent in 1959). On the other hand, fuel imports have remained constant and raw materials and semi-manufactures have declined slightly over the twelve-month period.

The distribution of imports among the countries of the area during the period 1957 to 1959 indicates a steady share in the rise of imports into Guinea, the Ivory Coast and Upper Volta. The slow rise of imports into Senegal, the Mali Republic and Mauretania taken together may be due to the fact that, with the dissolution of former political ties between the members of the former French West African Federation, Senegal has lost its rôle as an entrepôt for the distribution of imports to the area.

The evolution of Ghana imports in recent years has been the result of (a) the accumulation of foreign exchange reserves during most of the post-war period;

PER CENT. SHARE OF MAJOR CATEGORIES IN TOTAL IMPORTS OF FORMER FRENCH WEST AFRICA, 1959

Country	Food, beverages and tobacco	Other consumer goods	Primary Products and semi-finished goods	Capital goods	Fuels
Senegal, Mali and Mauretania	34	34	12	15	5
Guinea	17	20	19	40	4
Ivory Coast and Upper Volta	18	38	13	25	6
Dahomey	25	26	20	18	11
Niger	32	39	9	15	5
Total, Former French West Africa :					
1959	26	33	14	22	5
1958	23	37	15	20	5

Source : Note d'Information de la Bangue Centrale des Etats de l'Afrique de l'Ouest, July, 1950.

(b) extensive development plans which came into operation in the early fifties, and (c) the relatively slow increase in production for the domestic market. The nominal value of Ghana's overseas balances which stood at U.S. $231.3 million in 1949 rose to a peak of $582.7 million in 1955 and were $531.4 million in 1956. Thus the capacity of Ghana to import was quite substantial on its attainment of independence in 1957. The significant fact was that, while increasing government expenditure was generating new incomes, domestic production of consumer goods was unable to keep pace with rising incomes or population growth.[14]

TABLE A/II. 21.—GHANA : IMPORTS BY CATEGORY AS PERCENTAGE OF TOTAL VALUE, 1955–59[1]

Category	S.I.T.C. Section/ Division	1955	1956	1957	1958	1959
Food, beverages and tobacco	0, 1	20	21	22	22	21
Basic materials and mineral fuels	2, 3, 4	7	6	8	8	6
Chemicals	5	6	7	7	8	8
Textiles	65	22	20	21	17	16
Machinery and transport equipment	7	17	19	17	18	23
Other Manufactures	6, 8	26	25	23	25	25
Miscellaneous	9	2	2	2	2	1
Total Imports (million U.S. dollars)	0–9	246	249	271	237	317

[1] Based on values expressed in current U.S. dollars.

Sources : Data derived from *U.N. Yearbook of International Trade Statistics and national trade publications.*

Although imports dropped considerably during the 1957/58 recession recovery was quite sharp and imports in 1959 rose by almost 34 per cent in value over the previous year, machinery imports rising in the same proportion as the increase in total imports. Transport equipment increased by 87 per cent; this rise probably reflected the import of 26 locomotives in 1959. More than 15 per cent of the increase in import value was accounted for by an increase of 12.3 million US dollars in food imports. Imports over the first five months of 1960 amounted to 165 million US dollars and were 34 million US dollars ahead of exports, and a little less than 48 million US dollars above the level of imports for the same period in 1959. The marked increase in imports for this period of the year was due to the import of railway equipment (U.S. $14 million) in May,

[14] Ghana Economic Survey, 1957, pp. 3 and 7. In 1959 this situation is still one of Ghana's major preoccupations (Ghana Economic Survey, 1959, p. 79).

1960. The provisional figures for January to May seem to indicate that imports have been running at an annual average rate 20-30 per cent higher than in 1959.

In 1955 the most important import categories in terms of value and percentage share in the import package were textiles; food, beverages and tobacco; machinery and transport equipment and other manufactures. Together these categories accounted for nearly 85 per cent of total imports. At the end of 1959 the overall picture was still the same except that the share of machinery and transport equipment in total imports had increased from 17 per cent in 1955 to just under 23 per cent and textiles had fallen from 22 to a little below 16 per cent. These shifts are consistent with the country's economic development in recent years, with its emphasis on industrialization. The high share of food imports (around one fifth of total imports throughout the years 1955-59) underlines one of the most crucial problems which will confront the country in the sixties—the development of local production to keep pace with population growth and the rising standard of living.

The development of **Nigerian** imports in recent years has been influenced by the fact that prior to 1955 governments—both federal and regional—had been spending less than they received, while statutory bodies also continued to pile up reserves. Furthermore, the steady growth in commercial bank deposits was not matched by a corresponding increase in lending.[15] However, from 1955 onwards increasing expenditures on the part of governments and the statutory bodies, together with the banks' more liberal credit policy, tended to stimulate imports. This tendency was emphasized by the increase in foreign investments and by a liberal import policy. In 1958 and 1959 the general import licences which had been introduced to permit the import of all kinds of goods from the United Kingdom and the British overseas territories were extended, with certain major exceptions to cover imports from Japan and the Dollar Area. By the second half of 1959 most imports were allowed without restriction, excepting non-essential imports from countries of the Soviet bloc.[16]

TABLE A/II. 22.—NIGERIA: IMPORTS BY CATEGORY AS PERCENTAGE OF TOTAL VALUE, 1955–59[1]

Category	S.I.T.C. Section/ Division	1955	1956	1957	1958	1959
Food, beverages and tobacco	0, 1	13	14	16	14	15
Basic materials and mineral fuels	2, 3, 4	6	6	7	7	7
Chemicals	5	5	5	5	5	6
Textiles	65	25	24	21	21	—
Machinery and transport equipment	7	21	21	21	24	25
Other manufactures	6, 8	28	28	29	28	—
Miscellaneous	9	2	2	1	1	1
Total Imports (million U.S. dollars)	0–9	381	428	427	467	502

[1] Based on values expressed in current U.S. dollars.

Sources: Data derived from *U.N. Yearbook of International Trade Statistics and national trade publications.*

As regards the commodity pattern of imports, Nigerian trade statistics over the past five years show the same tendencies as in Ghana, except that imports of food, beverages and tobacco, though around 14 per cent of total imports through this period, are not quite as high a component of the import package. Machinery and transport equipment, textiles and other manufactures together accounted for over 70 per cent of total imports both in 1955 and in 1958. But, as in Ghana, the relative share of textiles has been falling gradually and there has been a corresponding rise in the share of machinery and transport equipment. Mineral fuels have also been edging up steadily in response to increasing demand for both industrial and domestic power and to the needs of a growing transport system.

Current development plans and bright prospects for foreign investments would seem to suggest that Nigerian imports will continue to grow at a much faster rate than in the previous five years. It is expected that these growing imports will be financed from past savings, overseas loans and foreign private capital.[17]

Guinean imports outside former French West Africa, valued in current US dollars, reached a record level in 1958 and 1959 (60 million US dollars) registering an increase of 50 per cent over the corresponding figure in 1956. Imports of machinery and transport equipment—most of which was required for the construction of the F.R.I.A. aluminium factory and the extension of port facilities at Conakry—amounted to 40 per cent in value of total imports. Contrary to general West African trends, there has been a steady decline in imports of transport equipment since 1957; imports of passenger vehicles declined by 44 per cent over the period. Although food imports as a whole fell sharply, imports of wheat flour increased from 2,800 ton in 1958 to 17,600 tons in 1959. Rice imports also increased considerably, but the most remarkable increases was in sugar imports which more than doubled over the period 1957-1959. Over 50 per cent of the increase in rice and flour imports came from eastern Europe and Mainland China while the total increase in sugar imports came from eastern Europe. Sugar imports rose from 4,591 tons in 1958 to 17,144 tons in 1959. Of this total about 11,400 tons came from the east European countries. The high level of sugar, flour and rice imports from the socialist countries is the result of barter

TABLE A/II. 23.—REPUBLIC OF GUINEA: GEOGRAPHICAL DISTRIBUTION OF IMPORTS EXPRESSED AS PERCENTAGE OF TOTAL VALUE OF IMPORTS

Areas/Countries of Origin	1957	1958	1959
Franc Zone	74·6	76·9	73·7
(France)	(65·6)	(72·0)	(70·0)
Sterling Area	5·0	4·9	1·4
Dollar Area	9·4	6·6	7·6
(U.S.A.)	(8·0)	(5·9)	(6·3)
O.E.E.C. Countries[1]	9·3	10·9	7·8
(West Germany)	(3·3)	(3·0)	(2·6)
Centrally Planned Economies[2]	—	—	9·3
(Czechoslovakia)	(—)	(—)	(3·3)
(East Germany)	(—)	(—)	(2·6)
Others	1·7	0·7	0·2

[1] Other than France.

[2] Aggregate of East Germany, Hungary, Poland, Czechoslovakia, U.S.S.R. and Mainland China.

Source: *Note d'Information de la Banque Centrale des Etate de l'Afrique de l'Ouest*, No. 58, May 1960.

[15] **Economic Survey of Nigeria, 1959**, p. 97.

[16] **Op. cit.**, p. 94.

[17] **Op. cit.**, pp. 99-100.

agreements and does not necessarily reflect an increase in the consumption of these commodities,[18] although this may subsequently follow.

In spite of the considerable shift in Guinean imports the countries of the Franc Zone continued to supply the bulk of them in 1959. Franc Zone exports to Guinea represented 74 per cent of total imports of which France alone supplied 70 per cent.[19] Imports from the Sterling Area declined by 68 per cent in 1959, while dollar imports increased by 31 per cent, bringing the percentage share of dollar imports to 8 per cent of total imports. The share of the OEEC countries (excluding Franc Zone countries) fell from 11 to 8 per cent. However, the most important change in the geographic distribution of Guinean imports between 1958 and 1959 was the sharp rise in imports from the centrally planned economies in eastern Europe and Mainland China from practically nil in 1957 to 9.3 of total imports in 1959. The same trend was evident in the export figures where the total share of east European countries increased from 3.2 to 16.2 per cent.

An interesting feature in the development of Guinean trade in 1959 was the sharp decline in the separately recorded maritime trade with the seven members (Senegal, the Mali Republic, Ivory Coast, Dahomey, Niger, Mauritnania and the Vota Republic) of the West African Customs Union.

Imports from the Customs Union countries declined from U.S.$9.0 million to $1.9 million in 1959 while exports fell from $1.9 million to $0.1 million. The most significant decline was in the trade with Senegal, which until that time was Guinea's most important trading partner in West Africa.

Imports into the former **French Equatorial Africa** have shown a rising trend since 1955, although there was a considerable drop in 1959. Machinery and transport equipment constituted the most important import category and represented about 30 per cent of total imports from 1956 to 1958. Textile imports have been fluctuating since 1955 but reached a peak in 1958. Basic materials and mineral fuels are developing significantly and may be a pointer to increasing industrial development. If the proposal to invest $89 million in the extraction of manganese ore comes into effect, the stimulus to imports should be quite marked, first, on account of the machinery and materials required for the construction and operation of the mines and, secondly as a result of increased foreign exchange earnings and the rise in local domestic incomes.

TABLE A/II. 24.—FORMER FRENCH EQUATORIAL AFRICA: IMPORTS BY SELECTED CATEGORIES AS PERCENTAGE OF TOTAL VALUE 1955–59[1]

Category	S.I.T.C. Section/ Division[2]	1955	1956	1957	1958	1959
Food, beverages and tobacco	0, 1	20	19	16	19	—
Basic materials and mineral fuels	2, 3, 4	8	9	8	8	—
Textiles	65	12	7	7	10	—
Machinery and transport equipment	7	26	30	32	30	—
Total Imports (million U.S. dollars)	0–9	105	117	141	140	127

[1] Based on values expressed in current U.S. dollars.

[2] As published data are not in S.I.T.C., classifications are approximate.

Sources: Data derived from *U.N. Yearbook of International Trade Statistics and national trade publications.*

South and East Africa

The **Republic of the Congo** is among the few African countries which have been experiencing a steady decline in imports, both in value and volume, since 1957. From 1955 total imports had been growing until they were checked by the 1957-1958 world recession. Thereafter total imports, which had amounted to 436 million dollars in 1957, declined progressively to 308 million dollars in 1959. During the same period the quantum index of imports (1953=100) fell from 118 to 86. Although the decline was spread over all categories of imports, machinery and transport equipment experienced the greatest regression. However, it should be noted that import of capital goods into the Congo have been at a relatively high level—over 30 per cent of total imports since 1956—and, although, their decline in absolute terms after 1957 was considerable, their relative share in the total import package was fairly well maintained.

TABLE A/II. 24 (1).—CONGO (LEOPOLDVILLE); QUANTUM INDEX OF IMPORTS, 1955–59[1]
(1953 = 100)

Category	1955	1956	1957	1958	1959
Consumer goods	122	138	145	117	116
Food products, textiles and footwear	132	150	149	133	135
Raw materials and simi-finished goods	133	145	150	127	120
Capital goods	83	88	85	66	50
Total Imports	107	117	118	96	86

[1] Figures include Ruanda-Urundi.

Source: *La Situation Economique du Congo Belge et du Ruanda Urundi* (1958, p. 187; 1959, p. 226).

Textiles and food, beverages and tobacco have since 1955 accounted for a relatively modest share of total imports, no doubt owing to the existence of local manufacturing capacity, which has enabled a significant degree of import substitution to be achieved. The production of certain consumer goods (textiles, food products, beverages and footwear among others) has been growing since 1950 and imports of these items, particularly those destined for African consumption, have been declining. The production of

[18] There appears to have been a shortage of sugar because the low retail price in Guinea encouraged clandestine exports to neighbouring countries (see **Marchés Tropicaux**, October 15, 1960).

[19] However, during the first nine months of 1960, imports from France amounted to only one-third of total imports from the same source for the corresponding period of 1959—a result mainly of the cessation of imports of machinery and equipment for the FRIA project (see **Banque Centrale des Etats de l'Afrique de l'Ouest—Statistiques**, No. 64, November, 1960). Thus in 1960 Guinean imports began to show a similar shift away from the French market as was noticeable for exports in 1959 (see Chapter II, Section b (iii)).

footwear, for instance, has developed considerably. In 1953 local industry produced over half-a-million pairs of footwear; this figure rose to 2 million in 1956 and to 3 million in 1959.

TABLE A/II. 25.—INDICES OF FOOD AND TEXTILES PRODUCTION IN THE CONGO, 1953–59[1]
(1947–49 = 100)

	Food, Beverages and Tobacco (processing)	Textiles (manufacturing)
1953	186	446
1954	212	524
1955	237	601
1956	272	697
1957	296	618
1958	283	628
1959	314	741

[1] Figures include Ruanda-Urundi.

Source: *La Situation Economique du Congo Belge et du Ruanda Urundi*, 1959, p. 212.

Imports into **Angola** have been growing since 1955 and reached a record level in 1958. Imports of capital goods appear to have become quite important; this points to a certain degree of economic development in the territory. However, among producer goods cement imports declined from 110,000 tons in 1954 to 2,000 tons in 1959. This is due to the fact that local production, which has been growing rapidly in recent years, is increasingly replacing imports. Imports continued to rise during the first half of 1959, but the value of total imports for the whole year showed a smaller increase than the tendency in the earlier part of the year had suggested. Figures for the first two months of 1960 pointed to the continued growth of imports, particularly of capital goods, but the shortage of foreign exchange had already begun to check the growth of imports by the end of the first half of the year. The effect of import restrictions imposed in May will no doubt have a further adverse effect on imports.

Although direct information on **Mozambique's** imports are rather scanty, evidence from other sources seems to suggest a continued expansion of imports in the last three years. During the first eight months of 1958 imports were 20% higher than in the corresponding period of either 1956 or 1957. In contrast to the general increase, imports of the main consumer items like cotton and silk fabrics and wines declined somewhat. On the other hand there was a marked rise in imports of capital goods, reflecting the growth in investment expenditures. Although imports of rolling stock fell, those of agricultural machinery, together with iron and steel products and railway equipment (other than rolling stock) rose 40% above the 1957 level.

Like the Republic of the Congo, the **Federation of Rhodesia and Nyasaland** has been experiencing a decline in imports since 1957. The growth of imports into the Federation, as in the case of many other African countries, has been related to the growth of export earnings and investments. Until the beginning of 1956 copper exports had been rising and the growth of foreign exchange earnings had been deflected in a corresponding rise in imports. Furthermore an investment boom in the early fifties gave a stimulus to the growth of imports, particularly of capital goods. However, in 1958 imports began to decline, partly as a result of the world economic recession, and thereafter the downward movement of imports continued through 1959, no doubt fed by the falling off in foreign investments arising from the continuing uncertainties regarding the political future of the territory. It is likely that investments will remain sluggish until the future of the area becomes more certain.

TABLE A/II. 26.—RHODESIA AND NYASALAND: IMPORTS BY CATEGORY AS PERCENTAGE OF TOTAL VALUE, 1955–59[1]

Category	S.I.T.C. Section/ Division	1955	1956	1957	1958	1959
Food, beverages and tobacco	0, 1	10	8	1	10	10
Basic materials and mineral fuels	2, 3, 4	9	9	9	11	10
Chemicals	5	7	7	8	8	8
Textiles	65	9	9	8	7	—
Machinery and transport equipment	7	34	36	36	34	35
Other manufactures	6, 8	31	31	30	29	—
Miscellaneous	9	—	—	—	1	—
Total Imports (million U.S. dollars)	0–9	388	446	497	441	420

[1] Based on values expressed in current U.S. dollars.

Sources: Data derived from *U.N. Yearbook of International Trade Statistics and national trade publications.*

Future changes in imports will at all events be materially influenced by the completion of major investment projects. Thus, the commissioning of the Kariba dam is bound to result both in a decrease of imports of machinery and transport equipment and in a reduction of imports of electricity from the Congo.

The establishment or projected establishment of motor vehicle assembly plants by several big companies will be reflected first in higher imports of machinery, and subsequently in a shift in imports from complete vehicles to vehicle parts. The tyre factory which is already in operation will bring about a similar shift in respect of rubber manufactures.

Imports of capital goods have been at a very high level since 1955 and have maintained their relative share of the import package. In 1957 capital goods were 35.8% of total imports, and in 1959 their relative share was still 35%. Because of a high level of local production, textile imports have constituted a rather small percentage of total imports, and were never above 9% for the period 1955 to 1959. Similarly food imports form a small percentage of total imports.

Since 1955, when imports were at the high level of 417 million U.S. dollars, **British East African** imports have not shown any signs of growth; instead, they took two sharp downward movements in 1956 and 1958. Since 1957 economic activity in the territories of British East Africa has been "hesitant" probably as a result of political uncertainties surrounding the

future of the territories of Kenya and Uganda, which may have influenced foreign investors to hold back.

Imports of machinery and transport equipment have been at a fairly high level, although they have been fluctuating around a declining trend. From 31% in 1955 their share in total imports fell to 25% in 1958 and was slightly up at 27% in 1959. The share of food imports is much lower than in many African countries and, although it has been rising since 1955, was only 8% of total imports in 1959. This is due to the fact that food production and food processing are fairly well advanced and the territory is a net exporter of certain food products. Although it is difficult to assess the future prospects for imports at this time, there is little doubt that the projected construction of the Shell Oil refinery at Mombasa, the packaging plant in Nairobi, the Michelin Tyre factory and the 12 million-yard cotton mill in Tanganyika, and the Aluminium Rolling Mill at Dar-es-Salaam will all contribute to some extent to a further stimulation of imports of capital goods.

TABLE A/II. 27.—KENYA, UGANDA AND TANGANYIKA: IMPORTS BY CATEGORY AS PERCENTAGE OF TOTAL VALUE, 1955–59[1]

Category	S.I.T.C. Section/ Division	1955	1956	1957	1958	1959
Food, beverages and tobacco	0, 1	6	7	7	7	8
Basic materials and mineral fuels	2, 3, 4	10	12	13	13	12
Chemicals	5	5	5	6	7	7
Textiles	65	13	13	15	14	14
Machinery and transport equipment	7	31	30	26	25	27
Other manufactures	6, 8	28	27	28	28	27
Miscellaneous	9	7	6	5	6	5
Total Imports (million U.S. dollars)	0–9	417	375	392	339	340

[1] Based on values expressed in current U.S. dollars.
Source: Data derived from *U.N. Yearbook of International Trade Statistics and national trade publications.*

Although **Ethiopian** imports which had been growing steadily from 1953 declined slightly in 1956, they recovered rapidly and actually increased throughout the recession. During the period 1956 to 1959 imports rose by about 6% annually and except during 1957 were throughout ahead of exports. Up to 1958 imports of food, beverages and tobacco averaged 7% of total imports, but increased sharply to 11% in 1959 mainly as the result of poor harvests in 1958. Nevertheless food imports are relatively moderate compared with many African countries. Following the sharp rise in imports in 1959 some measures were taken to restrict imports, particularly of luxury consumer goods. The remarkable feature of Ethiopian imports was the high level of textile imports—29% in 1955, 30% in 1957 and 21% in 1959. The decline in the relative share of this group is linked with expanding domestic production. A growing domestic textile industry is expected, in due course to result in further reduction of textile imports; it is proposed to double production capacity within the next three years. Machinery imports have shown a slightly fluctuating but upward trend, and in the year 1958-1959[20] investment goods amounted to 26.4% of total imports. During the four years beginning 1955-1956 there was a slight but noticeable shift toward imports of investment goods.[21] However, the level of consumer goods is, in absolute terms, still quite high and has increased much more than that of investment goods.

TABLE A/II. 28.—ETHIOPIA: IMPORTS BY CATEGORY AS PERCENTAGE OF TOTAL VALUE, 1955–59[1]

Category	S.I.T.C. Section/ Division	1955	1956	1957	1958	1959
Food, beverages and tobacco	0, 1	8	9	6	8	10
Basic materials and mineral fuels	2, 3, 4	14	13	15	13	13
Chemicals	5	4	5	6	5	5
Textiles	65	27	31	30	24	21
Machinery and transport equipment	7	23	20	20	26	29
Other manufactures	6, 8	24	22	23	24	22
Miscellaneous	9	—	—	—	—	—
Total Imports (million U.S. dollars)	0–9	68	63	72	79	84

[1] Based on values expressed in current U.S. dollars.
[2] As published data are not based on S.I.T.C., classifications are approximate.
Source: Data derived from *U.N. Yearbook of International Trade Statistics and national trade publications.*

South African imports have developed at a rather high level from 1950 on, but they fell sharply in 1959 (U.S.$851.2 million in 1950, $1,555.1 million in 1958, and 1,368.4 million in 1959). However, food, beverages and tobacco and other consumer goods have declined in relative importance, being replaced by domestic production.

Forty per cent. of the decline represented a decline in imports for the public sector, due partly to the world economic recession and partly to the slowing down of economic activity in South Africa. The decline in economic activity may be largely due to the drying up of foreign investments and the gradual but steady depletion of foreign exchange reserves occasioned by flights of capital from the Union. Capital flights were intensified in 1960 as political and racial tension mounted, particularly after the "Sharpville" incidents in March, 1960. From that time the country's foreign exchange reserves declined to reach a low level of $320.9 million by the end of June, 1960.[22] Although economic activity had not revived in any significant way, imports rose in the early part of 1960 and from April to July were averaging over $135.8 million per month. Consumer goods appear to account for most of this increase, the only capital goods in greater demand being agricultural machinery, mining equipment and machinery for local consumer industries. Imports of general industrial and electrical machinery have, in contrast, fallen sharply. On the other hand, exports have not been very active; this, together with the decline in reserves, may lead to balance-of-payments difficulties.

South African trade may experience considerable difficulty if a Republic of South Africa is not treated as a Commonwealth country. In such an eventuality South Africa may lose considerably in Commonwealth preference, and its competitive position vis-a-vis certain Commonwealth countries may be quite seriously affected. However, as illustrated by the case of Eire, the Ottawa agreement on Commonwealth preferences do not appear to be directly dependent on Commonwealth membership.

[20] Gregorian Calendar

[21] Ethiopian Economic Review, June, 1960, p. 45.

[22] Reserves fell from $425.5 million in March to $364.8 million in April. South African shares also dropped in value by about $1.4 billion.

Development Programmes and Policies in Africa

Prepared by the Economic Commission for Africa

The purpose of this article is to classify and describe the development programmes and policies laid down for a number of countries and territories in Africa. One of the difficulties which an attempt of this kind immediately faces is the fact that details of government policy on economic development are often an internal matter only. Policy statements made are usually couched in rather general terms, and modifications in policies or basic plans are not always made public.[1] Development plans have been published for many countries and territories of Africa and have often served as a basis for government capital expenditure and other policy measures. In some cases, however, the published plans have been quietly discarded because of changes in external conditions or in government thinking, while governments have continued to base their investment and other policies either on changed fundamentals or on *ad hoc* considerations. In other cases, no plans have been published although serious work is known to have been done by the governments in economic analysis and projections of economic trends—work fundamental to policy formulation but the results of which are either considered confidential or have not yet been prepared for publication. In the following pages, therefore, the rather formal attitude is taken that only those programmes and policies are summarised which are publicly known.

Nature of Plans

In treatises on development programming, a distinction is often made between two techniques in establishing the development plan: a programming approach and a project approach. The programming approach starts from overall targets of national income, and estimates subsequently the concomitant levels of consumption, capital formation, imports, exports and other relevant aggregates of the economy. In a further analysis these totals may be broken down by certain sectors, exchanges and relationships between which, may be calculated and fitted into a consistent framework. Thus one can arrive at a more or less detailed description of the economy during a certain period, or at some future date, on certain assumptions regarding external factors as well as the coefficients of the system. This picture of the future economy yields indications of the policies to be followed if the economy is to reach the targets fixed and maintain the desired equilibrium. A further analysis of the sectors leads to a detailed formulation of the projects to be carried out in the context of the plan.

The other possible approach, the project approach, is to start at the other end, from individual projects proposed which could be worked into a comprehensive plan. Cost-benefit calculations regarding the direct and indirect impact of such projects on the economy can be added to give, together with certain general extrapolations, e.g., of population increase, an overall picture of the changes to be expected in the economy. The aspects of projects to be taken into account are, on the one hand, increases in production, income, employment, exchange earnings, tax receipts and the like, and, on the other, requirements of capital, materials, labour of varying types of skill, foreign exchange, and extra demands put on public facilities, etc. This approach, which should in theory result in the same kind of plan as the programming approach is, however, rare in practice.

Some countries in Africa, including most of those on the shores of the Mediterranean, have adopted the programming approach in their planning. However, development plans in Africa are usually not comprehensive; they are mainly public capital expenditure programmes containing no projections, objectives or targets for the private sector. Even though they contain lists of projects, these plans should not be confused with the project approach to development programming described in the previous paragraph; for these plans take no, or very limited, account of the impact of the projects on the economy. As far as demands on resources are concerned, the only aspect usually assessed has been capital costs, although in recent years, in an increasing number of cases, the effect on current budgets has been estimated and taken into consideration. The only benefits normally estimated have been direct benefits, i.e., no explicit account has been taken of the wider repercussions on the economy. As a

[1] See for instance E/CN.14/42, paras. 11-12, and E/CN./14/42/Add 1.

consequence, it has always been difficult in these plans to establish proper priorities and make rational comparisons between projects. The plans concerned are therefore more truly government capital expenditure programmes than development programmes proper, even though certain expenditure items are sometimes included that are not, in a narrow sense, capital expenditure. The most noteworthy of such items are certain agricultural development expenditures which, although of a non-recurring nature, cannot properly be defined as outlay on the construction of capital works. In contrast, the plans referred to often contain genuine capital items which would appear in any normal government capital budget and which do not constitute a special effort to stimulate the economic development of a country, the most striking example being the capital expenditure on the maintenance of local security and public order and the construction of government administrative buildings which is included in many of the recent development plans in Africa.

Certain of the plans discussed in the following pages relate to component parts of federally governed countries, viz., Rhodesia and Nyasaland, and Nigeria. It goes without saying that each of the territorial or regional and federal governments can only plan for those functions for which it is responsible and that, consequently, these plans are complementary and should be examined in connection with each other. The fact that this is not always done here should not be taken to mean, that this connection is disregarded, but rather that the plans concerned are used as illustrations of a certain attitude or of certain policies.

Certain countries have decided to embark on the elaboration of a comprehensive plan; some have taken only the first preparatory steps, while others have determined an analytical framework and decided on general directives to be pursued. These plans form a special group in so far as they cannot be called fully articulated comprehensive plans; but, as they contain projections of certain aggregates of the economy, they incline towards overall programmes.

The percentage distribution of public capital expenditure is shown in Table B. II. 1, in order to illustrate policies pursued by the various governments. In the cases of Ethiopia, U.A.R. (Egypt) and Algeria only, the patterns of expenditure have been determined within the context of overall plans; all the other countries and territories listed have "plans" which may be more appropriately referred to as "public capital expenditure programmes."

Classification of Plans

The development programmes encountered in Africa can best be classified, first, according to the techniques applied and, secondly, according to the lines of economic policy followed. In the case of comprehensive plans, these lines are, in principle, unambiguously determined by the system, although in practice there still remains much room for manoeuvre, particularly in the selection of the policy instruments. Where capital expenditure programmes are concerned, however, the lines of economic development are more or less freely chosen by the government and therefore offer a useful criterion for classifying these programmes.

In the following pages attention will be focussed mainly on economic investments, social and particularly administrative investments being treated only by implication.

Classification:

Capital expenditure programmes with emphasis on infrastructure development:

Programmes related to evacuation of primary products, concentrating mainly on transport, and possibly education and health. Examples are: Federation of Nigeria, Northern Nigeria, and many other countries and territories in Africa, in their earlier plans.

Programmes indirectly related to industrialisation, adopted by countries which do not or need not take direct action to encourage industrial development but which concentrate on electricity production, in addition to transport and possibly other infrastructure expenditure. Examples: The Federation of Rhodesia and Nyasaland, and Uganda.

Capital expenditure programmes with emphasis on directly productive investments:

Programmes which stress agricultural development to the point of a genuine agrarian and land reform with a view to reorganising the productive structure and to developing domestic markets. Examples of this category are Southern Rhodesia and Kenya.

Programmes stressing the expansion of existing agricultural patterns and designed to increase quantities available for export and to improve the quality of the products. Many countries fall within this group. Examples described in these paras. are the Ivory Coast, Togoland, the Malagasy Republic, Nyasaland and the Sudan.

Programmes emphasising industrialisation, e.g., Ghana, Western Nigeria, and to some extent Eastern Nigeria, and the 1958/59 plan for Morocco which, however, contains a rather far-reaching agricultural programme as well.

Overall Programmes:

Programmes of countries which have started on comprehensive planning and which have made pro-

jections of the overall framework of the economy but have not yet arrived at a fully articulated comprehensive plan. Examples described below are the work done in Mali (former French Sudan), and largely also the plan for Ethiopia, and the F.A.O. studies of Morocco and Tunisia.

Comprehensive programmes comprising detailed and articulated sector programmes, such as the plans (so far as they are known) for Morocco, Tunisia, U.A.R. (Egypt), and Algeria.

The dividing lines between the groups are not as sharp as may appear from this classification, which is introduced merely for convenience and should not be taken too literally.

up and brought into contact with the money economy. Possibilities have to be created for evacuation of surplus production to the markets. Thus the Federal Government of Nigeria and many other governments in their earlier plans concentrated on transport as a first necessity. Transport bulks large in almost all the plans in Africa, but at subsequent stages governments give increasing attention to other aspects of the economy. In the Northern Region of Nigeria and a number of similar areas, with their long distances and scattered populations, this item will remain of considerable importance for some time to come.

TABLE B/II. 1.—PUBLIC CAPITAL EXPENDITURE IN DEVELOPMENT PROGRAMMES

		Government Capital Expenditure in U.S. per head per annum	Percentage Distribution						
			Agriculture	Industry	Electricity	Transport Communications	Education	Health	Other
Nigeria (Fed. of)	55/60	2	3	2	8	61	4	3	19
(rev. 58)	55/60	2	2	1	8	59	5	1	24
(rev. 59)	55/62	1	1	1	7	56	6	2	27
Togo	49/54	2	8	—	—	58	5	17	12
Rhodesia & Nyasaland (Fed. of)	57/61	12	3	—	45	41	4	4	3
	59/53	7	2	—	44	35	8	6	5
Uganda (rev. 57[1])	55/60	4	4	3	26	15	7	5	40
Southern Rhodesia	57/61	9	13	—	28	19	2		38
Kenya	54/57	5	26	1	—	13[11]	10	4	46
	57/60	3	38	—	1	14[11]	9	4	34
Nyasaland	57/60	4	22[5]	—	—[5]	10	8	—	60
Ivory Coast	47/56	7	16	—	3	64		17	
	58/62	10	33	3[3]	2	30	12	4	16
Malagasy Republic	59/62[2]	8	38	1	1	36	7	8	9
Togo	54/59	3	33	—	—	43	4	6	14
	59/60[3]	2	22	—	—	43	7	14	14
Sudan	59/61[4]	8	39	2	2	36[13]		13	8
Portuguese Overseas Provinces	59/64	4	40[6]	—	—	45	7	7	8
Ghana	59/64[12]	40	7	8	31	15	9	13	17
Western Nigeria	55/60	3	3	20	3	12	22	6	34
(Rev. 58)	55/60	3	3	17	2	17	17	8	36
	60/65	5	23	14	2	15	8	2	36
Eastern Nigeria	58/62	1	5	8	—	23	25	5	34
(Rev. 60)	58/62	2	4	8	—	25	21	5	37
Ethiopia	57/81	2	7	10[10]	11	54	5	3	10
Morocco	58/59	10	35	4	2	15	10	3	31
United Arab Republic (Egypt)	59/61[4]	33	24[7]	29	3[7]	23		21	
Algeria	59/63	44	23	7	7	22	12	3	26

1 Including expenditure by the Uganda Electricity Board.
2 Excluding European Development Fund expenditure.
3 Fund for Assistance and Co-operation and European Development Fund Programme.
4 Capital development budgets for the years 1959–60 and 1960–61.
5 The Shire river valley project included in agriculture.
6 Natural resources development; presumably agriculture and mineral prospecting.
7 The high dam included in agriculture.
8 Expenditure for mineral prospecting.
10 3% to be spent on investments in publicly-owned mines.
11 Excluding railways.
12 Including expenditure on the Volta river project.
13 Including expenditure by the Sudan Railways.
N.B. Figures for expenditure in U.S. are not strictly comparable: they have been converted at prevailing exchange rates, which do not necessarily—and do not in fact in this case—reflect the relative price levels in the different countries and territories. It can be safely assumed that the price level for investments in the Franc Zone territories has been considerably higher than in other areas.

SURVEY OF PROGRAMMES AND POLICIES

Public capital expenditure programmes with emphasis on infrastructure development

The choice of emphasis among categories of capital expenditure is determined by many factors, such as the particular situation of the country with respect to resources, existing facilities, level of human development achieved, etc.

Programme related to evacuation of primary products.

In the initial stages, governments are concerned with with the most basic equipment. Areas have to be opened

Programmes indirectly related to industrialisation

The Federal Government of **Rhodesia and Nyasaland** has a rather "laissez-faire" approach to economic development. It is the stated policy of the government "that economic activity . . . should be privately owned and operated and that the activity of the government in the economic field should be limited to providing the best possible plans for economic expansion including the professional services to facilitate that expansion."[2] Therefore, the emphasis in development policy and in

[2] Development plan 1959-1963, p. 1.

government capital expenditure is almost entirely on basic facilities. Transport and electricity generation absorbed 86 per cent. of Federal capital expenditure in 1957, and 79 per cent in 1959 (see table).

The Federation's plans have been based on expectations of development in the private sector of the economy, so that "expansion in the latter would be matched by the growth of the services provided by the Government." In the past 10 years, owing to the rapid progress made, the Government has not needed to make extensive forecasts of the course of private development, as its main preoccupation could not but be the removal of already existing bottlenecks particularly in the two fields mentioned above. With the removal of the most acute of these bottlenecks around the year 1957-58, the Government would have had more freedom of choice in its policy but for the fact that its available finances had decreased. Therefore, in the 1959-63 plan priority had to be given to those investments that were required to enable, on the one hand, the projected demand for services to be met on the basis of existing standards and, on the other, the works already committed to be completed. Past decisions thus proved important in the establishment of priorities for the future programme. In the field of electricity generation, expenditure was determined by the stage reached in the Kariba project. Though this scheme was approaching completion at the time this plan was drawn up, it was still responsible for the bulk of the expenditure on electricity generation and distribution. In the case of transport, large sums of money were to be spent on roads and bridges constituting major traffic links, which were already behindhand in traffic carried. This expenditure was intended to increase the road network's carrying capacity (mainly by asphalting). The position was similar in the case of railroads. Though in 1958 there was no shortage of carrying capacity on the railroads, the plan includes improvements, mainly to permanent way and to traffic and operating facilities, designed to increase long-term capacity and rolling-stock efficiency.

The Federation has been in a specially fortunate situation among African countries because of its exceptionally rapid growth over the past 15 years. This growth, mainly due to the increasing income of the mining companies, combined with the influx of capital and the immigration of skilled labour. As a result of it, the problems encountered in development programming elsewhere in Africa did not arise to the same extent in the Federation. As already mentioned, the role of the Government could accordingly be limited to following the impetus given to development by the private sector, seeing that existing bottlenecks were removed and that no new ones developed, and keeping down inflationary pressures. The Government was fortunate enough to have just the right amount of finance at its disposal; hence there were, so to speak, none of those problems of choice which would otherwise have existed: in the case of more ample means, in which direction to guide the economy; in the case of smaller resources, which bottlenecks to remove.[3]

In general, however, infrastructure investments and basic facilities although a necessity, are not a sufficient condition for economic development. Unless an economy is in the process of expansion due to other factors, the existance of an infrastructure by itself will not induce growth. This has been a common experience in Africa. **Uganda** is a case in point where the Owen Falls hydro-electric station, among others, was built in the hope that the availability of cheap electricity would attract secondary industry. This did not materialise in any significant way. The project facilitated the establishment of industries for which the other establishment factors were already favourable, but it did not have the impact expected. The hope would have been justified if an investigation had shown that high electricity prices were the only factor retarding industrial expansion, as things are special government measures are needed to remove other inhibiting factors. The first revision (1957) of the 1955-60 plan, if appropriations for the Uganda Electricity Board are included, devotes £12 million, or 26 per cent. to electricity production (see table). Although the initiation of bulk sales of electricity to Kenya has considerably increased actual generation and turned the Board's financial results from negative to positive, there is still a large unused capacity.

As regards the remainder of the programme, importance is attached to the promotion of approved standards of agriculture, to transport and to the advancement of social services to ensure favourable conditions for the expansion of primary production. Fair distribution of funds between districts and provinces and between towns and countryside is strongly stressed. The Uganda Government has been keenly aware of the regional aspects of planning; it actually stresses rural rather than urban development. Certain sums are devoted to the advancement of commerce and industry (see table), although in both cases mostly in relation to agriculture. Part of these funds is allocated to co-operative development, mainly for the processing and evacuation of produce, part to African business enterprises, and part to the Uganda Development Corporation. The latter, which was created to encourage development by investment in agricultural, industrial or mining projects, will be obliged to raise finance required over and above the contribution under the development plan without recourse to Government funds.

Public capital expenditure programmes with emphasis on directly productive investments:

Programmes containing an agrarian reform.

In the plan for **Southern Rhodesia,** which is the focus of industrial expansion in the Federation, a high percentage is devoted to the same items as in the federal plan. The Federal Government has planned its capital expenditure for the functions for which it is responsible. Their plans have consequently been supplemented by the plans of the territorial governments for those sectors for which they are responsible. The territorial projects therefore are in a number of cases complementary to those of the Federation. Examples of this are the territorial roads and bridges which are feeders to the main traffic links and local electricity plants, distribution systems and connections.

Southern Rhodesia devotes a much larger part of its capital expenditure to the improvement of agriculture than the Federation (see table). Apart from an amount

[3] The latter problem did play a certain rôle at times during the period.

of £1 million (three per cent. of total capital expenditure) for what is called "Kariba bush clearing," which is meant to increase the future possibilities for net-fishing in the artificial lake, most of this item is allocated to the improvement of African agriculture and the reorganisation of the indigenous rural production structure.

The Land Husbandry Act of 1951 comprised an agrarian and land reform in areas set aside for African settlement by the 1930 Land Apportionment Act. It was intended to effect a departure from communal to individual land ownership within these areas, to increase agricultural productivity and to dispose of the twin problems of unstable migratory labour and the disintegration of the rural areas.[4] A more radical land reform is recommended in the recent report of the Select Committee of the Legislative Assembly on Resettlement of Natives.[5] This report envisages a system in which land ownership would not be based on racial criteria and which would open up opportunities for Africans to acquire more economic land units anywhere in the country and with security of tenure.

In **Kenya,** the attitude displayed in the plan to industrial development is similar to that found in the Federation of Rhodesia and Nyasaland. The policy of the Government of Kenya is based on the encouragement of development mainly through private enterprise. For this encouragement it is necessary not only to "remove natural disadvantages" but also to "provide those basic services which already exist in more developed economies."[6] However, the economic situation itself is very unlike the one in the Federation. In Kenya, as in most of the other countries of Africa, the economy was not expanding rapidly and the Government has not therefore been primarily concerned with the removal of bottlenecks resulting from rapid growth. The Government here had to make a choice between various possible lines of development and to stimulate development on the lines that offered the best prospects. It had to fix a balance between the different lines and to establish priorities between investments. Without a comprehensive projection of the economy, it must, like most other governments in their development plans, have been unable to establish these priorities on a rational basis. The Kenya Government chose to concentrate on development of the agricultural sector and in particular on the agricultural production of the Africans. It stated that "economic development must be planned on the basis of those known assets and advantages which can be readily deeloped, the main one of which Kenya is agriculture."[7] In addition the Government felt that "agricultural development, as compared with industrial urban development, makes relatively small demand for basic services and skilled manpower. In relation to potential productivity a concentration on agriculture for a number of years should allow time for the country to build up a reservoir of skilled manpower for non-agricultural development at a later date."[8] In addition, agricultural production has, according to the Government, the advantage at this point of not suffering from diminishing returns. For these reasons, the Government felt that, in its development policy, it has considered the investments showing the most immediate and highest returns for the amounts involved. As such an evaluation only relates to isolated aspects of the projects, the choice among investments—as stated above—rests only partially on a rational basis.

The agricultural programme of Kenya has in the past recognised that European-type farming in the highlands operates at a level different from that on tribal lands. Two separate but parallel programmes of agricultural development have, therefore, been promulgated. The first of these, to cover the highlands, was presented as the "Troup Report" in 1953 under the title "An Inquiry into the General Economy of Farming in the Highlands." The second, popularly known as the **Swynnerton Plan,**[9] was launched in 1954. This plan, with which the current consolidation of land in the rural areas is to be associated, had definite targets of agricultural output to reach within a decade. It includes proposals for a land reform with establishment of medium-size holdings and security of tenure and for intensification of cultivation, improvement of agricultural techniques and of marketing facilities and the provision of credit. Both the Troup and Swynnerton Plans were launched at a time when, owing to the social and political climates, the country seemed resigned to separate racial development. There has recently been a departure from this policy, however, as evidenced by the 1960 amendment bill, which opens the former White Highlands to Yeomen and peasant settlement schemes.

After agriculture (see table)—disregarding "other" expenditures, which are to a considerable extent related to the "emergency"—the next largest item in the programme is expenditure on transport, mainly roads (railways are the responsibility of the East Africa High Commission). In accordance with the stated priority, the road-building programme concentrates on roads needed for the evacuation of agricultural produce.

The amounts spent on electricity production, the bulk of which is in private hands, and on industrial development under the 1954-57 and the 1957-60 programmes are very small. Support for electricity production concerned a case in which nothing could be expected from private initiative at the time and in which the existing plant had to be expanded and kept in operation until such time as private interests could be found to take over. Industrial development is promoted through a development corporation and two revolving funds established to develop industrial sites on which the title to the land is cleared, access roads are constructed and service connections provided. In the latter case only token contributions are made, although it is said that substantial allocations will be considered at a later date, if found necessary.

Programmes with emphasis on the development of export agriculture

In a number of other countries, the main emphasis in government capital expenditure is also on the

[4] **What the native land husbandry act means to the rural African and to Southern Rhodesia.** Salisbury, 1955.

[5] Legislative Assembly Select Committee 3, Salisbury, 1960.

[6] The Development Programme 1957-1960, p. 1.

[7/8] Op. cit., p. 5.

[9] Government of Kenya. A plan to intensify the Development of African Agriculture in Kenya, Nairobi, 1955.

development of agriculture, though in a less revolutionary way than in Southern Rhodesia and Kenya.

In **Togo, the Ivory Coast** and **the Malagasy Republic,** methods adopted for the development of the agricultural sector are fairly similar. They include among others, attempts to achieve increased yields, diversification of crops, improvement of quality, stabilisation of prices at as favourable levels as are compatible with world market conditions and the formation of producers' village co-operatives. The last-named, in particular, is considered a major means of achieving the improvements envisaged. The expansion of production in these countries is mainly directed towards exports. In the Ivory Coast, for instance, only one sixth of the amount to be spent is directly devoted to increasing food crops. A similar situation prevails in the Togo Republic.

In Madagascar, the situation is more pressing because of serious soil erosion and, therefore, action has to be more radical, problems of low production and low productivity being tackled on several fronts at the same time. Agricultural production is supposed to increase at a rate of 6 per cent. per annum, in the face of a population increase of 3 per cent. per annum. Such a great effort necessarily requires a considerable contribution from domestic savings and investments in kind produced for own account. Expansion and diversification of export production, development of raw materials for a light processing industry, expansion of fodder production and intensification of animal husbandry, capped by soil conservation and anti-erosion measures, are indicated. According to its three-year programme (1959-62), the Government of the Malagasy Republic also aims at reorganisation of commerce and stabilisation of prices, establishment of some produce-processing facilities, improvement of the natural environment in specific areas (by constructing small waterworks, evacuation roads and soil conservation works, instituting forest control and a re-afforestation programme, and introducing new crops, livestock vaccination programmes, etc.), expansion of its agricultural extension services and of rural education, and support for co-operative associations and other rural groupings.

As to other sectors, expenditure on transport in Togo concerns improvements to the wharf and the railways to be financed by the Economic Development Fund of the European Economic Community and to road construction and improvements, all closely connected with the needs to evacuate produce. Immediate prospects for industrialisation are slight in Togo; hence expenditure under this item is negligible. Expansion of electricity production by private enterprise remains limited to the electricity plant constructed in connection with the new phosphate mines near Anécho.

In the Ivory Coast, the aims of the third 4-year plan of 1958-62, next to agricultural expansion, are more rapid social development, particularly in education, health and housing, and the continued improvement of the infrastructure (ports, waterways, roads, etc.). Encouragement of industries is not reflected in the expenditure pattern, as the Government proposes to achieve this by creating a favourable climate for private enterprise mainly through tax concessions and the protection of local industry.

In Madagascar the remainder of the programme is directed towards transport, education and health. Industrial expansion does not occupy the first place in the Government's thinking; the Government nevertheless intends to favour light industries using local materials or catering for the domestic market. Industrial investments are exempt from income and profit taxes, while, in addition, certain investments benefit from long-term fiscal arrangements. As it does not expect large capital imports, the Government limits its capital expenditure on energy production to studies on possible large-scale hydro-electric installations and to subsidies to small local electricity plants.

The **Sudan** is another country where exepnditure is largely directed towards agriculture. In the Government capital expenditure budget (including the expenditure of the Sudan Railways), for the two years 1959-60 and 1960-61, 41 per cent. will go to productive investments (mainly in agriculture). Of the remainder 36 per cent. goes to transport (see table). The agricultural programme differs from those previously discussed in that a large part of the funds will be spent on extending the area under irrigation. Improvements in methods will not, however, be neglected, and increased yields and eradication of diseases are engaging the attention of the Government. Industrial development is furthered by tax concessions to approved industries.

Expenditure under the 1957-61 development programme for **Nyasaland** is mainly concentrated on re-afforestation, soil conservation and land improvement schemes and on preliminary works for the Shire river valley project. The territory's stated policy is to "increase crop production by means of better agricultural methods and to lay foundations of a better system of land use on which further rapid progress may be made subsequently."

Programmes emphasising industrialisation:

In the fifth group of countries and territories, the emphasis in economic development policy is on the creation of an industrial apparatus. Hence capital expenditure is concentrated on the establishment of industries, but with due regard to the still pressing claims of infrastructure investment and agricultural expansion, which accounts for the fact that the percentage devoted to industry by this group of countries does not reach the level of the main categories in the plans of the other countries and territories.

In **Ghana,** the most important project under the Government's development plan is the Volta River hydro-electric scheme, which is foremost among the Government's concerns and is considered essential to all future industrial development. Under the Second Development Plan (1959-64), the Government envisaged spending Gh. £100 million as soon as the preliminary studies and negotiations on this project were concluded. This amount could not be accurately fixed at the time and was kept outside the plan proper, which itself involved a total expenditure of £243 million over the five-year period. The electric power to be produced by the Volta River project is generally considered to be essential not only for the development of an aluminium industry, and consequently for the exploitation of the

bauxite deposits in the country, but also as a source of cheap and abundant power for the general development of industry in the area. The Government's position on the project is connected with the emphasis on industrialisation in its development policy.

The plan aims at the establishment of not less than 600 factories of varying size, producing a range of over 100 products without however specifying the nature of the products nor assessing their feasibility or their implications for the economy. The measures proposed for the furthering of the envisaged industrial expansion are as follows:

Industry is offered a certain measure of customs protection, which would not, however, increase the cost of living in any significant way. Foreign private investment would be attracted either through financial participation by the Government or firm guarantees of investors' rights. New industries would be given all possible assistance, such as the preparation of studies and investigations of new projects. With this end in view an Industrial Promotion Commission and an Investment Promotion Board have been set up. The Industrial Development Corporation, which already existed, participates in enterprises that otherwise would not have been started. The Government proposes to give special aid to African businessmen. It also prepares industrial sites for occupation by new industries. It is the intention of the Government to stimulate decentralisation by encouraging the establishment in some 20 different provincial centres of industries for which the advantages of establishment in an area of industrial concentration are not of prime importance.

As can be seen from the table, a considerable percentage is allocated to transport, the largest share going to roads and harbours, while agriculture, particularly export agriculture, is not neglected. In agriculture, emphasis is on raising cocoa yields, mainly by spraying against capsid, increasing areas under rubber and bananas, and laying the foundations for a cattle industry. The programme also covers efforts to raise cereal yields, to bring the Volta flood plain under irrigation and to study and promote the use of fertilisers. Research, education and extension are a natural complement of the other projects of the programme and are therefore also included.

In **Nigeria,** too, there is strong emphasis on industrialisation, although this does not emerge clearly from the Federal capital expenditure pattern (see table). It is in the Eastern Region, and particularly in the Western Region, that an active policy in this direction is pursued. The measures adopted are Government initiative in attracting and participating in foreign enterprises, preparation of industrial sites with adjacent housing estates, provision of industrial credits, safeguards for foreign investors, tax and tariff incentives and encouragement of small African businesses. In the Western Region an Industrial Promotion Commission has the task of furthering rapid development by carrying out surveys of industrial possibilities, organising technical and market research, arranging publicity overseas regarding prospects for the establishment of industries, and attracting foreign interests. This industrialisation policy is pursued within the context of a set of objectives (Western Region), the first and foremost of which is to provide employment for the emerging literate labour force by actively encouraging the private sector to invest in new projects and by removing obstacles to that sector's activities.

So much stress has been laid on education in recent years that both the Eastern and Western Regions are now enjoying universal primary education. It is interesting to note that in the Western Region, with the achievement of this goal, the school-building programme shrank in the 1960-65 plan as compared to the 1955-60 one. In the Eastern Region, where the extension of free primary education was a few years behind the Western Region, the figures do not as yet show this decline.

Large sums have also been spent on transport, which still accounts for a considerable part of government capital expenditure. As stated above, in the Northern Region basic facilities, particularly transport, are still absorbing the bulk of government investments.

For the next two or three plan periods, the major item of capital development will be the construction of a dam on the Niger River. This dam is expected, not only to give cheap and abundant power, but also to facilitate control and development of the Niger flood plains, to feed irrigation schemes and to improve considerably the navigability of the Niger River. The impact on economic development of this project is expected to be substantial, and investigations and studies of the plans are at an advanced stage.

The governments aim also at ensuring that food production keeps pace with the expansion of the non-agricultural sector of the economy, and with the concomitant structural changes. The relatively small sums spent on agriculture in the past were increased in the latest (1960-65) programme of the Western Region. While previously expenditure on agriculture was concentrated on research and extension, the new plan contains a programme of tree-planting and financial participation in new plantations. It also includes the creation of credit facilities for farmers and a scheme for co-operative farm settlements.

Overall Plans

Apart from the countries which actually have comprehensive plans, an increasing number of other African countries also take a more fundamental view of development programming. Thus the Government of the Malagasy Republic has stated that only full-scale economic planning is capable of furnishing a rational basis for the establishment of proper priorities and that, consequently, it intends to start preliminary work on such a programme.[10] Other countries have either started preparatory work on such plans, e.g., Nigeria, or have reached a more or less advanced stage of the process by formulating their basic principles and objectives of development programmes and by making overall projections of major economic aggregates.

An example of the latter group of countries is **Mali** (former French Sudan), where an increase in income

[10] Programme Triennal de Développement Economique et Social 1959-1962, p. 39.

per head of at least 5 per cent. per annum has been selected as the main development target. Since the population increases by 2 per cent. per annum the corresponding target for total production is to be at least 7 per cent. Given this target, and assuming a capital output ratio of 4 : 1 (i.e., 4 per cent. of the gross domestic product has to be invested to yield a 1 per cent. production increase), it is estimated, that up to 28 per cent. of the gross domestic product, or 10,000—12,000 million francs C.F.A. per year, will have to be invested.

In more concrete terms, the objective of the Government is to raise the level of living in the countryside to that at present obtaining in the towns. This is regarded as necessary to reverse the flow of population into the towns by offering the farmer a future in which he can have confidence. The strong emphasis on agricultural and rural development reflects the relatively unfavourable conditions for industrialisation prevailing in the country at the present time.

The approach to the improvement of agricultural production is rather unusual in that it is basically social or humanistic, the first aim being to change the psychological attitude of masses to development. The Government intends to begin by convincing the people that development has to be earned by increased effort on their part and by improved working methods and more efficient organisation of activities. The methods proposed range from better use of productive time to the introduction of new techniques and the improvement of tools used. A changeover from extensive to intensive agriculture is envisaged, while soil conservation and land improvement, as well as extension of cultivated areas, is to be carried out during the slack periods of the year. A number of supporting measures have been prepared concerning, for example, the regularisation of the collecting trade and of prices for agricultural produce, the provision of agricultural credit and the improvement of transport.

In the initial phase of the development process, contemplated increase in taxation will be designed to permit only a slight rise in consumption to prevent expenditure on what the Government considers "useless purposes" and to enable the State to take upon itself the responsibility for saving and capital formation. In a subsequent phase, after the proposed educational programme has made its impact, disposable incomes will be allowed to increase and more room will be left for private initiative and enterprise. At the present stage, however, according to the Government, the attitude of the masses to development must be transformed from a passive to an active one. As traditional education works slowly to that end, the change must be accomplished by political action. Accession to independence should give the masses, 5 per cent. of whom the illiterate, a psychological shock of national feeling through which this end may be achieved. The existing well-organised political party should, according to the Government, be the instrument in this action.

Although the overall plan discussed in the foregoing paragraphs is framed in fairly general terms, it contains proposals for reorganising and revitalising the rural areas as well as the administration, and it concludes with the statement that it will be elaborated by and for the people and executed by the Government and the people working closely together for the same ideal.

Ethiopia has gone a step further and has drawn up a plan for the years 1957-61, which presents relatively detailed projections for the various sectors of the economy. An increase in national income of 3.7 per cent. per annum is aimed at, which, allowing for an estimated population increase of 1.5 per cent. would leave an increase in income per head of 2-2.5 per cent. In the labour market, the creation of 140,000 new jobs is envisaged. The cost of this expansion in investment over the period has been estimated at Eth$674 million (including Eth$139 million for "non-monetary" agricultural own-account construction), which implies a capital output ratio of 2.4: 1 by the end of the period.

Approximately 45 per cent. of investments (excluding investment in kind in agriculture) would be financed out of foreign loans, aid, and reparation payments. Most of domestic savings will originate in the government sector (27 per cent. of total financing is budgetary savings). The rather small percentage of private monetary investments (about 25 per cent., almost half of which would be foreign) gives an interesting indication of the scope of government intervention in the economic development process.

The pattern of public investments (see table), as it emerges from the plan, shows strong emphasis on transport and, in particular, on road-building. The Koka dam hydro-electric project, which is being financed from Italian reparations and has involved a considerable outlay, has now been completed. Of the agricultural and industrialisation programmes, both of utmost importance for the growth of the economy, the latter can be expected to have the more immediate effect in raising production.

Funds under the agricultural programme are mainly devoted to strengthening the Ministry of Agriculture and promoting its extension services, as well as to support a number of research institutions. Within the past year, a marketing board for agricultural produce, the "Grain Corporation," was set up to regulate the collecting trade for agricultural produce—mainly grain, pulses and oilseeds—and, by increasing the stabilising prices paid to producers, to give the rural population incentives to increased productivity. The potentialities for expansion of agricultural production are considerable. The country has large fertile areas of uncultivated land which, owing to their isolation, cannot possibly be brought under cultivation for the production of salable surpluses. This feature of the country lends special importance to the road-building programme. Apart from the improvements to be introduced by research and extension, the Government proposes to encourage investments in agriculture, particularly by expanding agricultural credit, for which Eth$10 million would be available under the plan.

The industrial programme aims in general at improved utilisation of the country's raw materials, so as to meet the growing demands of the home market. About half of the investments in industry will be financed from public funds, so that the Government will have ample opportunity for guiding development in the desired directions. Private investment in industry is to be

encouraged by increased facilities for the provision of industrial credit on favourable terms. Investments are also to be stimulated by the Government through joint ownership by State and private interests, or through the establishment of State enterprises where private initiative is not forthcoming. In the latter case, the enterprises may be subsequently taken over by private interests. Further encouragement will be given by tax concessions to industries considered of national importance.

Rather sizeable foreign loans have been obtained, in certain cases for the foreign currency portion of the investments. Difficulties have at times been encountered in finding profitable projects in which to use these loans, a signal proof of this being the accumulation of foreign reserves under the plan to the amount of two-thirds of the official foreign loans and foreign aid expected for the programme. The difficulty is that, apart from the smallness of the markets for many products, some cost factors in the country are relatively high. The establishment of an industry is therefore not profitable without special assistance unless at least one cost factor is particularly favourable. The attention given by the Government to road building and electricity generation should prove important in bringing costs down.

For a detailed examination of the Ethiopian Five-Year Plan see "Ethiopia Observer," Vol. III, No. 4.

In connection with its Mediterranean Development Project, F.A.O. prepared a one-country study of **Morocco** and another of **Tunisia** in close co-operation with the governments concerned. These studies contained projections of major economic aggregates over a period of ten years to provide a general framework for the comparatively detailed recommendations made for the F.A.O. sectors. The results obtained have been taken into account in the further work on development programming carried out by the Moroccan and Tunisian Governments.

The F.A.O. approach was very similar for both countries. As the need to increase employment is pressing, the starting points taken for the projections were the estimated increases of population and labour force. Projections of employment in 1970 for four broad sectors of the economy led, via estimates of value added per worker, to figures for total production in 1970. Production increases, according to these projections, will be 4-4½ per cent. per annum in Tunisia and five per cent. per annum in Morocco. The growth is not quite so fast in Tunisia as in Morocco, since the creation of employment, and hence the application of more labour-intensive methods, was given higher priority in Tunisia, which somewhat slows down expansion.

The capital formation necessary for the projected production increase is calculated on a global basis by means of a capital output ratio of 3½:1 in the first five years and of 4:1 and 5:1 respectively for Morocco. The difference between the capital output ratios used in the two countries is another reflection on the greater emphasis on employment-increasing and labour-intensive techniques in Tunisia. Savings are expected to increase from 12 to 17 per cent. of gross national product in Tunisia and from 14 to 18 per cent in Morocco. The shortage of savings in relation to the investment programme explains the deficit on the balance of payments and the need for foreign loans and investments. Projections of exports and imports were undertaken in order to appraise this deficit and provide general guidance as to required changes in the structure of production

The need in both countries for increased savings could be partly solved by increased government savings. In order to achieve saving ratios of the order of magnitude indicated above, it was felt that the Governments would have to increase their shares in total savings by appropriate measures of fiscal policy. In addition, measures would have to be taken to encourage private savings, to limit imports of luxury consumer goods, and to direct domestic private savings to productive investments.

Against the background of these overall projections F.A.O. formulates detailed measures for reorganising the agricultural sector and improving agricultural production. Even though couched in fairly general terms, the F.A.O. plans yield quite a number of policy recommendations. However, if they are to play the role of a full-fledged comprehensive development programme, these plans must be amplified with far more details for specific sectors and projects, with due regard to exchanges and interaction between the sectors.

Comprehensive Plans

Planning techniques are on the whole more advanced in the case of the countries of North Africa. Comprehensive plans have been or are being prepared and, although not all material has been published, certain major characteristics can be ascertained from indirect sources.

Each of the two countries just discussed entered the field of comprehensive programming. At this time of writing, **Tunisia** is preparing a ten-year plan. In the past this country had capital expenditure programmes of the type discussed in earlier pages with the emphasis on infrastructure investment. These programmes had a greater effect on the Government's recurrent expenditure than on production. At present directly productive and employment-creating investments are receiving high priority within the framework of a comprehensive plan.

In **Morocco** a five-year comprehensive development plan has been prepared for the years 1960-64. Work on this plan was started in 1957 on the basis of three general directives: to increase agricultural production, to develop industries and to ensure maximum employment. For the intervening years 1958 and 1959, a capital expenditure programme was drawn up anticipating the broad policy lines of the five-year plan.

The three main pillars of this programme were improvement of the organisation of agriculture production and techniques, establishment of new industries and encouragement of investment based largely on an extension of Government intervention, and expansion of professional and technical training to meet the development expected in the different sectors of the economy. The emphasis in this programme was therefore on more direct productive investments (see table). Infrastructure investments were made particularly in those fields where they complemented and increased

the efficiency of earlier heavy investments of the same type, for instance, investments in agriculture, in new irrigation areas, in tertiary roads connected with major links, or in electricity distribution networks connected with hydro-electric schemes.

Under the agricultural programme, the agricultural reorganisation and mechanisation scheme (Operation Labour) received top priority. The scheme, which was started in 1957-58 on an area of 160,000 hectares, was supposed to cover 1 million hectares in five years. It was combined with measures for extension and agricultural credit. Furthermore, funds were earmarked in the programme for soil conservation and re-afforestation, and considerable sums were to be spent on irrigation schemes.

Industrial development was to be stimulated by improvements to infrastructure, reduction of energy and transport costs, a properly organised system of industrial credit, fiscal incentives such as exemption from duties on imports of industrial equipment, protection of local industries, etc., and by direct government participation in industry, particularly in the basic industries. A Bureau for Study and Industrial Participation (B.E.P.I.) was established to act for the State in this field. Basic industries, such as iron and steel, the chemical industry, those processing local raw materials and those serving the domestic market were to be encouraged first.

The five-year plan continues largely along the lines laid down in 1957. As already stated, it is a comprehensive plan, adapted from a number of sectoral plans drawn up by special study groups and fitted into an overall framework. In the overall approach, unemployment and under-employment and the creation of jobs—the figure of 400,000 over a period of five years is mentioned—have been in the forefront. Directives other than improved utilisation of the labour force have been better use of local resources and local capital, integration of the modern and the traditional economies by creating industries and introducing an agrarian reform, the formation of cadres and the expansion of education.

To achieve the target of 400,000 new jobs, production will have to increase at a rate of 5 per cent. per annum. This will require an annual investment of 1,730 million dirhans. As capital formation in 1958 was around 920 million dirhans, it appears that the Government intends to make an extraordinary effort. Though such a high level of capital formation is expected to have a significant effect on the balance of payments, a trade deficit caused by heavy imports of capital goods is felt to be permissible, particularly as it may be offset to some extent by increased income from tourist traffic.

In recent years, domestic savings have corresponded to between 12 to 14 per cent. of gross national product, while—according to the projections made—gross capital formation may reach the high level of 25 to 30 per cent. of gross national product during the planning period. A considerable increase in domestic saving would, therefore, appear to be necessary in order to keep the balance of payments deficits within the possibilities of foreign financing. If no capital import is forthcoming the attainment of the targets of income and employment would require policies designed to reduce consumption in relation to national product and to promote capital extensive production methods and techniques.

Higher duties on imports of luxury goods have been introduced to increase savings, while currency control has been established to prevent capital flight. Measures have also been taken to channel available savings into productive investments. In 1958 domestic savings exceeded capital formation by a comparatively small amount (1,100 million dirhans as against 920 million dirhans), and this discrepancy appears to have been significantly larger in 1959 as a result of the capital flight prior to the establishment of currency control in the middle of the year.

Another country with a comprehensive plan is the **U.A.R.** The Government of this country is of the opinion that planning should be a continuous activity underlying policy formation. In the Southern Region it has extensive machinery for analysing economic problems for studying the mutual consistency and relative priority of envisaged projects and for following developments in the economy and progress made in the implementation of programmes. The latter reflects the need that development programmes cannot be rigid but must be adjustable to actual situations in order to enable the Government to follow at all times the course of action most appropriate to national objectives and to prevailing circumstances.

The main possible lines of resource-development in the Southern Region of the U.A.R. are: (1) better utilisation of the Nile waters (a more stable flow could increase the area under cultivation by 30 per cent.), (2) better utilisation of the land (raising agricultural productivity and yields per acre by improved agricultural techniques), and (3) better utilisation of the labour force (creating more, and more productive employment).

Apart from the general objectives of increasing income and employment, the Government has as additional objectives an equitable distribution of income, and the transformation of agricultural labourers into land-owners. To the latter end, a far-reaching land reform has been proceeding since 1952. The extension of the area under cultivation, improved agricultural techniques, and the encouragement of agricultural co-operatives to enable small-holders to enjoy the advantages of large-scale operation and mechanisation, and the promotion of industry are considered the most important methods of fostering economic growth.

A comprehensive plan has been worked out with the aim of doubling the national income in ten years. This plan is divided into two stages of five years each. The first five-year plan for the years 60/61—64/65 has been officially approved and was launched in July, 1960. According to this plan, the national income should increase by about 40 per cent. in five years. This means an average increase of about 8 per cent. per annum, which is considerably higher than the rate of 4.7 per cent. achieved during the period 1952-57. Employment is expected to rise by 825,000 new jobs, or about 13 per cent. The total investment required for this expansion would be about Egyptian £1,700 million (about 26 per cent. of national income) with a foreign currency component of about 30 per cent. A detailed plan for

the first year (1960-61) has also been drafted, and for the first time the budget has been prepared on the basis of the plan, being divided into an ordinary budget covering current expenditure and a production budget. The latter, which includes all new works and development projects, amounts to Egyptian £286 million for this year compared to average annual capital formation of Egyptian £340 million—an indication of the high percentage of capital formation which will originate in the government sector. The distribution of this sum over the different categories of public capital expenditure illustrates the priorities accorded by the government (see table).

Several alternative national budgets for the first and last years of the plan period have been drawn up in order to assess the effect on the plan estimates of various assumptions made, particularly regarding the consumption function and export possibilities. The calculation of alternatives is undertaken to facilitate a choice between different policies.

The development plan contains an industry breakdown which establishes very detailed guiding lines for government industrialisation policy. In determining production targets for the different branches of industry, the expected demand was calculated by industry and by commodity category, while needs of capital, labour and raw materials were computed with the help of 44-industry and 83-industry input-output tables. The planning authorities also made a study of the sources and uses of the major commodities and services. Priority was given to export-increasing, import-replacing and employment-increasing industries.

The relationship between the formulation and implementation of development plans, on the one hand, and political problems and events, on the other, may be said to be especially significant in **Algeria,** which has been, and is still living through a political crisis. There is no doubt that any solution of the Algerian problem will have an impact on the economic development of the country in subsequent years. From this point of view, the importance to be attached to plans for Algeria may be said to depend upon political events. However, a description of the main technical and economic features of these plans may be of interest to government officials engaged in development planning, not only in North Africa, but also in other parts of the Continent.

A ten-year plan, "Perspectives Decennales," was published in March, 1958, for the years 1957-66. This plan was subsequently revised and amplified to become the five-year "Plan de Constantine" (June, 1960) relating to the 1959-63.

The "Perspectives" are based on two major objectives: (1) reduction of the prevailing high level of unemployment and raising of the standard of living, and (2) exploitation of Algeria's natural resources. Non-agricultural activities will have to play a predominant role in development, as the maximum feasible increase in rural production is estimated at 40 per cent. in 10 years and this would be largely outweighed by the high rate of population growth (2½ per cent. per annum). Expansion in the modern sector would benefit not only those transferring from agricultural to industrial employment, provided there was an appropriate social policy to assist them in such a fundamental change in their lives, but also those remaining on the land, who would enjoy a greater share in the increased agricultural product. Therefore the policy suggested is largely based on the need for industrialisation, and especially on the establishment of manufacturing industries. It is expected that market demand for the products of these industries will be created and expanded in the initial stage by a housing programme, an advantage of which is its high content of domestic inputs, by investment in oil prospecting and development of the oil industry, and by the expansion of the industrial sector itself.

Projection of the economy over a ten-year period reflects targets of an increase of 5 per cent. per annum in per capita income and the creation of 875,000 new jobs at the end of the period. The amount of capital formation deemed necessary for the proposed expansion is around 47,110 million N.F., 23,930 million of which will have to be financed from public and semi-public funds. The expected deficit in the balance of payments—an indication of the disequilibrium between savings and investments—would be largely covered by borrowing from the French Treasury and by metropolitan Government spending in Algeria.

The "Perspectives" mention four extraneous factors of great importance to the actual process of growth, unexpected changes in which would upset the extrapolations made in the plan: (a) at the time of writing, actual petroleum resources were still uncertain, and additional strikes could prove a major factor in future development; (b) a decline in the rate of population growth would produce a greater increase in per capita income; (c) substantial population shifts between rural and urban areas would represent highly important social and political factors that could have both stimulating and disturbing effects; (d) the rural population's attitude to development would be decisive for the success of development in the rural areas.

The methods used in the "Perspectives" are, briefly, as follows. Possible production levels by branch of industry were determined from detailed studies of present prospects of future demand. The amount of capital formation required to achieve such levels was then worked out and compared with the amount of finance available. Next, the resulting increases in income and employment were computed. Detailed calculations were made for 210 branches grouped in 27 sectors, and for 350 product categories. Subsequently, inter-sectoral relations were determined by branch of industry or economic activity and by category of product. The inter-industry tables are constructed in such a way that they are easily consolidated into a simplified system of national accounts.

Technical criticisms of the "Perspectives"[11] relate partly to the inadequate attention paid to extraneous factors like population increase, partly to lack of sufficient detail in the treatment of certain problems, such as unemployment, and partly to the assumption of economic union with France, which could frustrate

[11] R. Gendarme, **L'Economie de l'Algérie,** Paris, 1959, p. 291.

efforts at industrialisation. A more fundamental objection, however, is that the plan is considered too Keynesian in its assumption that encouragement of investments will automatically increase income and employment, whereas in an under-developed country such relationships do not work smoothly and are obstructed by bottlenecks, the worst of which is caused by the lack of trained people. Present unemployment affects, not a trained industrial force, but an illiterate rural population.

The Plan de Constantine, published in June, 1960, took the Perspectives Décennales several steps further by revising them in the light of changed conditions and by establishing detailed sectoral programmes. The target rate of growth was increased from five per cent. to six per cent. per head per annum, other figures being changed accordingly, and the agricultural, rural and industrial programmes were stepped up. The percentage distribution of public capital expenditure according to the plan is shown in the table. In addition to the programmes for agriculture and industry which are discussed below the Government intends to make heavy investments in transport and communications and electricity generation while a fairly large percentage will be devoted to education.

For the development of agriculture, increases in production per acre and in working hours are envisaged in the first place, as extension of the area under cultivation has only very limited possibilities. Education, agricultural extension and better adaptation to market conditions are the lines of approach proposed

The agricultural programme is built around newly formed rural communities which, by community action and with assistance from the Government, work together to improve rural conditions through, for example, mechanisation, and co-operatives. The programme includes a land reform designed to put land at the disposal of small farmers to the extent of a total of 250,000 hectares in five years, the annual rate rising to 100,000 hectares in the final year of the period. Farmers benefiting from this scheme should be able to double their incomes. This land reform began in 1956; but it was then thought too insignificant to have any noteworthy effect.[12] Meanwhile the area concerned has been extended and, in addition, the reform has been amplified to include measures to regulate land property rights. Agricultural research and extension, soil conservation and re-afforestation, though more traditional, are equally important aspects of the programme. Aggregate agricultural income is expected to increase by 27 per cent. and employment (number of man hours) by 23 per cent. over the period 1959-63. It is estimated that gross agricultural product could ultimately be tripled and, hence, on the assumption of constant numbers engaged, agricultural income per head also.

Despite the large sums of money and great attention devoted to agricultural development and the transformation of the rural masses, the growth of industry is considered vital to the development process, as industry will have to offer a livelihood to surplus rural population. The industrial development scheme in the Plan de Constantine is similar in pattern, broad lines and techniques to the "Perspectives." Any major differences are due to the clearer picture obtained of potential oil and gas productions; with the prospect of lower fuel costs and of supplies of primary materials, the establishment of heavy industries becomes more justified economically. Lower fuel costs will also affect many of the lighter industries. During the plan period, industrial production and employment (excluding petroleum and energy) will almost double, reaching 302 million N.F. and 243,000 employed respectively, at an estimated cost in investment of 3,200 million N.F., or some U.S.$5,400 per employee. As in the "Perspectives", detailed calculations are made starting from the expected demand by branch of industry and commodity category.

The industrial policy measures proposed to guide the expansion along the projected course bear on two aspects: (1) improvement of the economic conditions which have proved to inhibit the establishment and growth of industries and (2) financial assistance from the government to new enterprises as compensation for structural disadvantages, including those resulting from the fact that tariff protection had to be ruled out in view of the present economic union with France.

As the Algerian economy is an open economy, in the same sense that French (and eventually E.E.C.) imports enter freely, strong counter-balancing measures were considered necessary to assist Algerian industries against French and European competition. To that end, a system of subsidies and tax exemptions has been devised to compensate new industries for non-competitive production costs arising out of unfavourable establishment conditions.

New features of this system are two subsidies, one of up to 40 per cent. of the amount invested in fixed capital, the other of up to 35 per cent. of the wages paid for productive labour over a period of five years. The subsidy rates are varied according to the branch and site of the industry, in order to encourage decentralisation and to adopt support to the degree of backwardness of the industry.

The measures described have been chosen as an alternative not only to tariff protection but also to government participation in industry and the establishment of public enterprises on a general scale. It is also interesting to note that combined subsidies are granted for investments and provision of employment. If only investments were subsidised, the subsidies would tend to make the capital/labour ratio more capital-intensive, whereas the easing of unemployment is one of the main aims of economic policy. If, on the other hand, a subsidy based on the wage-bill alone were granted this would tend to introduce labour-intensive methods, which are sometimes less efficient, and which might, in the long run, prove either to be non-competitive or to keep real wages at a lower level than necessary, thus slowing down the expansion process.

As mentioned above, the percentages of the proposed subsidies are maximum ones. Their actual level would be determined from case to case, with an eye to the special character of the industry and to the special circumstances under which the enterprise works. A careful scrutiny of each case would clearly be necessary in connection with the problem raised in the previous paragraph.

[12] Gendarme, **op. cit.**, p. 278.

GENERAL OBSERVATION

From the foregoing pages it will be seen that most countries in Africa have made a special effort, in keeping with the resources at their disposal, to increase their rate of development. Each began by doing what seemed *prima facie* most important and certain basic facilities have been provided by governments. Now a stage has been reached where it becomes more and more difficult to say off-hand in what direction an economy should be guided to achieve its fastest rate of growth, and it becomes harder to foresee where bottlenecks may develop.[13] Many governments in Africa are therefore moving towards the acceptance of a more comprehensive conception of planning and economic policy, which they are now beginning to put into effect. As the component parts of national economies become more intergrated and knowledge of the workings of the economic mechanism accumulates, governments will be able to play an increasingly active role in the advancement of the well-being of their people.

The growing awareness of the need for more comprehensive planning is due to the problems that arose for governments out of the shift in emphasis in their development programmes in recent years towards more directly productive capital expenditure. This shift has occurred mainly at the expense of economic infrastructure investments (transport: see table, e.g. Ivory Coast, and Togo 1949/54-1954/59). But capital expenditure on social infrastructure, especially education, is on the whole increasing; under almost all the plans referred to above, education and technical vocational training are essential elements of the programme in view of the fundemental role played by education in economic development.

It has become a *cliché* to say that material improvement is but a means to an end and that human development is the ultimate aim. However, as most governments acknowledge, development is only possible with the active co-operation of the population. This, in turn, presupposes their desire for change and their confidence that the results of change will benefit them; but such understanding is again inhibited by poverty and suspicion and a general lack of awareness. A transformation of man himself will initiate and ensure the permanency of the advance. To describe economic development as a "human" problem may be somewhat too general; but it is probably the most fundamental way of stating the problem.

[13] It has been argued that mistakes are more costly, and the need for careful planning greater in the early stages of economic development than later on when available resources are less limited (see: E/CN.14/42/Add. 1, p. 11). In the present context, however, the point is made that the realisation of the difficulty of choice seems to have depended upon the level of development reached.

APPENDIX

List of Documents

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